

# ASMi-31

Sync/Async Short-Range Modem with  
Remote Management

Version 3.0



**data communications**

Innovative Access Solutions



# ASMi-31

## Sync/Async Short-Range Modem with Remote Management

Version 3.0

### Installation and Operation Manual

---

#### Notice

This manual contains information that is proprietary to RAD Data Communications Ltd. ("RAD"). No part of this publication may be reproduced in any form whatsoever without prior written approval by RAD Data Communications.

Right, title and interest, all information, copyrights, patents, know-how, trade secrets and other intellectual property or other proprietary rights relating to this manual and to the ASMi-31 and any software components contained therein are proprietary products of RAD protected under international copyright law and shall be and remain solely with RAD.

ASMi-31 is a registered trademark of RAD. No right, license, or interest to such trademark is granted hereunder, and you agree that no such right, license, or interest shall be asserted by you with respect to such trademark.

You shall not copy, reverse compile or reverse assemble all or any portion of the Manual or the ASMi-31. You are prohibited from, and shall not, directly or indirectly, develop, market, distribute, license, or sell any product that supports substantially similar functionality as the ASMi-31, based on or derived in any way from the ASMi-31. Your undertaking in this paragraph shall survive the termination of this Agreement.

This Agreement is effective upon your opening of the ASMi-31 package and shall continue until terminated. RAD may terminate this Agreement upon the breach by you of any term hereof. Upon such termination by RAD, you agree to return to RAD the ASMi-31 and all copies and portions thereof.

For further information contact RAD at the address below or contact your local distributor.

<b>International Headquarters</b> <b>RAD Data Communications Ltd.</b>	<b>North America Headquarters</b> <b>RAD Data Communications Inc.</b>
24 Raoul Wallenberg Street Tel Aviv 69719, Israel Tel: 972-3-6458181 Fax: 972-3-6498250, 6474436 E-mail: <a href="mailto:market@rad.com">market@rad.com</a>	900 Corporate Drive Mahwah, NJ 07430, USA Tel: (201) 5291100, Toll free: 1-800-4447234 Fax: (201) 5295777 E-mail: <a href="mailto:market@radusa.com">market@radusa.com</a>

## Limited Warranty

RAD warrants to DISTRIBUTOR that the hardware in the ASMi-31 to be delivered hereunder shall be free of defects in material and workmanship under normal use and service for a period of twelve (12) months following the date of shipment to DISTRIBUTOR.

If, during the warranty period, any component part of the equipment becomes defective by reason of material or workmanship, and DISTRIBUTOR immediately notifies RAD of such defect, RAD shall have the option to choose the appropriate corrective action: a) supply a replacement part, or b) request return of equipment to its plant for repair, or c) perform necessary repair at the equipment's location. In the event that RAD requests the return of equipment, each party shall pay one-way shipping costs.

RAD shall be released from all obligations under its warranty in the event that the equipment has been subjected to misuse, neglect, accident or improper installation, or if repairs or modifications were made by persons other than RAD's own authorized service personnel, unless such repairs by others were made with the written consent of RAD.

The above warranty is in lieu of all other warranties, expressed or implied. There are no warranties which extend beyond the face hereof, including, but not limited to, warranties of merchantability and fitness for a particular purpose, and in no event shall RAD be liable for consequential damages.

RAD shall not be liable to any person for any special or indirect damages, including, but not limited to, lost profits from any cause whatsoever arising from or in any way connected with the manufacture, sale, handling, repair, maintenance or use of the ASMi-31, and in no event shall RAD's liability exceed the purchase price of the ASMi-31.

DISTRIBUTOR shall be responsible to its customers for any and all warranties which it makes relating to ASMi-31 and for ensuring that replacements and other adjustments required in connection with the said warranties are satisfactory.

Software components in the ASMi-31 are provided "as is" and without warranty of any kind. RAD disclaims all warranties including the implied warranties of merchantability and fitness for a particular purpose. RAD shall not be liable for any loss of use, interruption of business or indirect, special, incidental or consequential damages of any kind. In spite of the above RAD shall do its best to provide error-free software products and shall offer free Software updates during the warranty period under this Agreement.

RAD's cumulative liability to you or any other party for any loss or damages resulting from any claims, demands, or actions arising out of or relating to this Agreement and the ASMi-31 shall not exceed the sum paid to RAD for the purchase of the ASMi-31. In no event shall RAD be liable for any indirect, incidental, consequential, special, or exemplary damages or lost profits, even if RAD has been advised of the possibility of such damages.

This Agreement shall be construed and governed in accordance with the laws of the State of Israel.

## Product Disposal



To facilitate the reuse, recycling and other forms of recovery of waste equipment in protecting the environment, the owner of this RAD product is required to refrain from disposing of this product as unsorted municipal waste at the end of its life cycle. Upon termination of the unit's use, customers should provide for its collection for reuse, recycling or other form of environmentally conscientious disposal.



# General Safety Instructions

The following instructions serve as a general guide for the safe installation and operation of telecommunications products. Additional instructions, if applicable, are included inside the manual.

## Safety Symbols



---

This symbol may appear on the equipment or in the text. It indicates potential safety hazards regarding product operation or maintenance to operator or service personnel.

---



---

Danger of electric shock! Avoid any contact with the marked surface while the product is energized or connected to outdoor telecommunication lines.

---



---

Protective earth: the marked lug or terminal should be connected to the building protective earth bus.

---



---

Some products may be equipped with a laser diode. In such cases, a label with the laser class and other warnings as applicable will be attached near the optical transmitter. The laser warning symbol may be also attached.

Please observe the following precautions:

- Before turning on the equipment, make sure that the fiber optic cable is intact and is connected to the transmitter.
- Do not attempt to adjust the laser drive current.
- Do not use broken or unterminated fiber-optic cables/connectors or look straight at the laser beam.
- The use of optical devices with the equipment will increase eye hazard.
- Use of controls, adjustments or performing procedures other than those specified herein, may result in hazardous radiation exposure.

**ATTENTION:** The laser beam may be invisible!

---

In some cases, the users may insert their own SFP laser transceivers into the product. Users are alerted that RAD cannot be held responsible for any damage that may result if non-compliant transceivers are used. In particular, users are warned to use only agency approved products that comply with the local laser safety regulations for Class 1 laser products.

Always observe standard safety precautions during installation, operation and maintenance of this product. Only qualified and authorized service personnel should carry out adjustment, maintenance or repairs to this product. No installation, adjustment, maintenance or repairs should be performed by either the operator or the user.

# Handling Energized Products

## General Safety Practices

Do not touch or tamper with the power supply when the power cord is connected. Line voltages may be present inside certain products even when the power switch (if installed) is in the OFF position or a fuse is blown. For DC-powered products, although the voltages levels are usually not hazardous, energy hazards may still exist.

Before working on equipment connected to power lines or telecommunication lines, remove jewelry or any other metallic object that may come into contact with energized parts.

Unless otherwise specified, all products are intended to be grounded during normal use. Grounding is provided by connecting the mains plug to a wall socket with a protective earth terminal. If an earth lug is provided on the product, it should be connected to the protective earth at all times, by a wire with a diameter of 18 AWG or wider. Rack-mounted equipment should be mounted only in earthed racks and cabinets.

Always make the ground connection first and disconnect it last. Do not connect telecommunication cables to ungrounded equipment. Make sure that all other cables are disconnected before disconnecting the ground.

## Connecting AC Mains

Make sure that the electrical installation complies with local codes.

Always connect the AC plug to a wall socket with a protective ground.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A. The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A.

Always connect the power cord first to the equipment and then to the wall socket. If a power switch is provided in the equipment, set it to the OFF position. If the power cord cannot be readily disconnected in case of emergency, make sure that a readily accessible circuit breaker or emergency switch is installed in the building installation.

In cases when the power distribution system is IT type, the switch must disconnect both poles simultaneously.

## Connecting DC Mains

Unless otherwise specified in the manual, the DC input to the equipment is floating in reference to the ground. Any single pole can be externally grounded.

Due to the high current capability of DC mains systems, care should be taken when connecting the DC supply to avoid short-circuits and fire hazards.

DC units should be installed in a restricted access area, i.e. an area where access is authorized only to qualified service and maintenance personnel.

Make sure that the DC supply is electrically isolated from any AC source and that the installation complies with the local codes.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A. The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A.

Before connecting the DC supply wires, ensure that power is removed from the DC circuit. Locate the circuit breaker of the panel board that services the equipment and switch it to the OFF position. When connecting the DC supply wires, first connect the ground wire to the corresponding terminal, then the positive pole and last the negative pole. Switch the circuit breaker back to the ON position.

A readily accessible disconnect device that is suitably rated and approved should be incorporated in the building installation.

If the DC mains are floating, the switch must disconnect both poles simultaneously.

## Connecting Data and Telecommunications Cables

Data and telecommunication interfaces are classified according to their safety status.

The following table lists the status of several standard interfaces. If the status of a given port differs from the standard one, a notice will be given in the manual.

Ports	Safety Status
V.11, V.28, V.35, V.36, RS-530, X.21, 10 BaseT, 100 BaseT, Unbalanced E1, E2, E3, STM, DS-2, DS-3, S-Interface ISDN, Analog voice E&M	SELV Safety Extra Low Voltage: Ports which do not present a safety hazard. Usually up to 30 VAC or 60 VDC.
xDSL (without feeding voltage), Balanced E1, T1, Sub E1/T1	TNV-1 Telecommunication Network Voltage-1: Ports whose normal operating voltage is within the limits of SELV, on which overvoltages from telecommunications networks are possible.
FXS (Foreign Exchange Subscriber)	TNV-2 Telecommunication Network Voltage-2: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are not possible. These ports are not permitted to be directly connected to external telephone and data lines.
FXO (Foreign Exchange Office), xDSL (with feeding voltage), U-Interface ISDN	TNV-3 Telecommunication Network Voltage-3: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are possible.

**Always connect a given port to a port of the same safety status. If in doubt, seek the assistance of a qualified safety engineer.**

Always make sure that the equipment is grounded before connecting telecommunication cables. Do not disconnect the ground connection before disconnecting all telecommunications cables.

Some SELV and non-SELV circuits use the same connectors. Use caution when connecting cables. Extra caution should be exercised during thunderstorms.

When using shielded or coaxial cables, verify that there is a good ground connection at both ends. The earthing and bonding of the ground connections should comply with the local codes.

The telecommunication wiring in the building may be damaged or present a fire hazard in case of contact between exposed external wires and the AC power lines. In order to reduce the risk,

there are restrictions on the diameter of wires in the telecom cables, between the equipment and the mating connectors.

---

<b>Caution</b>	To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cords.
----------------	---

---

---

<b>Attention</b>	Pour réduire les risques d'incendie, utiliser seulement des conducteurs de télécommunications 26 AWG ou de section supérieure.
------------------	--

---

Some ports are suitable for connection to intra-building or non-exposed wiring or cabling only. In such cases, a notice will be given in the installation instructions.

Do not attempt to tamper with any carrier-provided equipment or connection hardware.

## Electromagnetic Compatibility (EMC)

The equipment is designed and approved to comply with the electromagnetic regulations of major regulatory bodies. The following instructions may enhance the performance of the equipment and will provide better protection against excessive emission and better immunity against disturbances.

A good earth connection is essential. When installing the equipment in a rack, make sure to remove all traces of paint from the mounting points. Use suitable lock-washers and torque. If an external grounding lug is provided, connect it to the earth bus using braided wire as short as possible.

The equipment is designed to comply with EMC requirements when connecting it with unshielded twisted pair (UTP) cables. However, the use of shielded wires is always recommended, especially for high-rate data. In some cases, when unshielded wires are used, ferrite cores should be installed on certain cables. In such cases, special instructions are provided in the manual.

Disconnect all wires which are not in permanent use, such as cables used for one-time configuration.

The compliance of the equipment with the regulations for conducted emission on the data lines is dependent on the cable quality. The emission is tested for UTP with 80 dB longitudinal conversion loss (LCL).

Unless otherwise specified or described in the manual, TNV-1 and TNV-3 ports provide secondary protection against surges on the data lines. Primary protectors should be provided in the building installation.

The equipment is designed to provide adequate protection against electro-static discharge (ESD). However, it is good working practice to use caution when connecting cables terminated with plastic connectors (without a grounded metal hood, such as flat cables) to sensitive data lines. Before connecting such cables, discharge yourself by touching earth ground or wear an ESD preventive wrist strap.



## FCC-15 User Information

This equipment has been tested and found to comply with the limits of the Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the Installation and Operation manual, may cause harmful interference to the radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Canadian Emission Requirements

This Class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulation.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## Warning per EN 55022 (CISPR-22)

---

***Warning***

This is a class A product. In a domestic environment, this product may cause radio interference, in which case the user will be required to take adequate measures.

---

***Avertissement***

Cet appareil est un appareil de Classe A. Dans un environnement résidentiel, cet appareil peut provoquer des brouillages radioélectriques. Dans ces cas, il peut être demandé à l'utilisateur de prendre les mesures appropriées.

---

***Achtung***

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

---

# Declaration of Conformity

**Manufacturer's Name:** RAD Data Communications Ltd.  
**Manufacturer's Address:** 24 Raoul Wallenberg St., Tel Aviv 69719,  
Israel

declares that the product:

**Product Name:** ASMi-31

conforms to the following standard(s) or other normative document(s):

<b>EMC:</b>	EN 55022:1998	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement.
	EN 55024:1998	Information technology equipment – Immunity characteristics – Limits and methods of measurement.
<b>Safety:</b>	EN 60950:2000	Safety of information technology equipment.

## Supplementary Information:

The product herewith complies with the requirements of the EMC Directive 89/336/EEC, the Low Voltage Directive 73/23/EEC and the R&TTE Directive 99/5/EC for wired equipment. The product was tested in a typical configuration.

Tel Aviv, 28 November 2004



Haim Karshen  
VP Quality

**European Contact:** RAD Data Communications GmbH, Otto-Hahn-Str. 28-30, 85521  
Ottobrunn-Riemerling, Germany

# Quick Start Guide

---

Installation of ASMi-31 should be carried out only by an experienced technician. If you are familiar with ASMi-31, use this guide to prepare the units for operation.

---

## 1. Installing ASMi-31

### Setting Internal Jumpers

➤ To set internal jumpers:

1. Disconnect all cables from ASMi-31.
2. Locate and open a lid on the bottom panel at the rear of the ASMi-31 modem.
3. Set internal jumpers, according to the table below.

Jumper	Function	Possible Settings (Default settings in bold)
JP10, CHASSIS	Controls connection between signal ground and chassis ground	<b>CON</b> – Signal ground is connected to chassis ground DIS – Signal ground is isolated from the chassis ground
JP11, COMPAT	Controls the ASMi-31 compatibility with the older products, for example ASMi-31 with a half duplex management.	<b>NEW</b> – All the features of the unit's current version are enabled OLD – The unit's new features are disabled. ASMi-31 is fully compatible with older products.

### Connecting the Interfaces

1. Connect the line to the RJ-45 or terminal block rear panel connectors.
2. Connect the DTE to the appropriate rear panel connector.

### Connecting the Power

- Connect the AC or DC power to the ASMi-31 modem.

---

## 2. Configuring ASMi-31

Configure ASMi-31 to the desired operation mode via the front panel LCD and buttons. The initial configuration of the ASMi-31 modem includes selection of the

clock reference, transmission mode, data format for asynchronous transmission and operating data rate. Configuration must be performed for the local and remote modems.

## Selecting the Clock Mode

You must select the clock mode for both local and remote modem.

- **To select clock mode:**
  - Scroll to CLKTYPE under LINE CONFIG and select the desired clock type of the modems (INT RCV, EXT RCV, RCV INT, or RCV EXT).

## Selecting the Transmission Mode

You must select transmission mode for the modem (synchronous or asynchronous).

- **To select transmission mode**
  - Scroll to MODE under DTE CONFIG and select the desired transmission mode (SYNC or ASYNC).

## Selecting the Data Format

If you are using asynchronous transmission, you must select the data format (number of data bits, parity type and number of stop bits).

- **To select data format:**
  - Scroll to FORMAT under DTE CONFIG and select the desired data format.

## Selecting the Data Rate

You must select the operation data rate.

- **To select data rate:**
  - Scroll to DATARATE under DTE CONFIG and select the desired bit rate.

# Contents

## Chapter 1. Introduction

1.1 Overview.....	1-1
Product Options.....	1-1
Applications.....	1-1
Features .....	1-2
1.2 Physical Description .....	1-5
1.3 Functional Description.....	1-6
1.4 Technical Specifications.....	1-8

## Chapter 2. Installation and Setup

2.1 Introduction.....	2-1
2.2 Site Requirements and Prerequisites .....	2-1
2.3 Package Contents .....	2-2
2.4 Equipment Needed.....	2-2
2.5 Setting Internal Jumpers.....	2-2
2.6 Connecting the Interface Cables .....	2-4
Connecting the Line .....	2-4
Connecting the DTE .....	2-5
Making ASMi-31 Compatible with Older Products.....	2-5
2.7 Connecting the Power .....	2-6

## Chapter 3. Operation

3.1 Turning ASMi-31 On .....	3-1
3.2 Controls and Indicators .....	3-1
Front Panel.....	3-1
Normal Indications.....	3-2
3.3 ASMi-31 Default Settings .....	3-3
3.4 Configuration Alternatives.....	3-4
LCD Structure .....	3-4
Control Menus .....	3-4
3.5 Turning ASMi-31 Off .....	3-5

## Chapter 4. Configuration

4.1 Menu Tree .....	4-1
4.2 Configuring Line Parameters.....	4-2
Selecting the Clock Type .....	4-2
Selecting the Rate Adaptation Method .....	4-3
4.3 Configuring the DTE Parameters.....	4-4
Configuring Transmission Mode.....	4-4
Configuring Data Format .....	4-5
Selecting the Data Rate .....	4-6
Selecting DCD Mode.....	4-7
Selecting the DSR Mode .....	4-8
Configuring the LLB Option .....	4-9
Configuring the RLB Option.....	4-9
4.4 Matching the Line and DTE Settings of the Modems .....	4-10
4.5 Displaying the Modem Status .....	4-11

**Chapter 5. Troubleshooting and Diagnostics**

- 5.1 Detecting Errors.....5-1
  - Power-Up Self-Test.....5-1
  - Front Panel LEDs.....5-1
  - Burst Messages.....5-1
- 5.2 Handling Alarms.....5-3
- 5.3 Testing ASMi-31.....5-4
  - Running Loopback Tests .....5-4
  - Remote Digital Loopback (RLB) .....5-5
  - Running the BER Testing.....5-7
  - Running the LEDs Test .....5-8
- 5.4 Technical Support .....5-9

**Appendix A. Pinouts**

**Appendix B. IR-ETH Interface Module**

**Appendix C. IR-IP Interface Module**

**Appendix D. IR-G.703/CO Interface Module**

# Chapter 1

---

## Introduction

---

### 1.1 Overview

ASMi-31 is a 2-wire IDSL modem with remote management, extending data transmission to 7 km (4.3 miles) over 24 AWG lines. The modem operates in full duplex over 2-wire links and can be programmed to work at a wide range of data rates, variable transmission levels, and using different DTE interfaces.

### Product Options

The following versions of the modem are available:

- **ASMi-31/M** – A master standalone version with a front panel LCD and buttons.
- **ASMi-31/S** – A slave unit features a blank panel with a 20-pin connector. A portable control unit (PCU) can be connected to the front panel 20-pin connector to enable changing or monitoring of the slave version.

### Applications

*Figure 1-1* illustrates the ASMi-31 central site application with SNMP management, where four remote ASMi-31 units operates opposite Megaplex-2100.

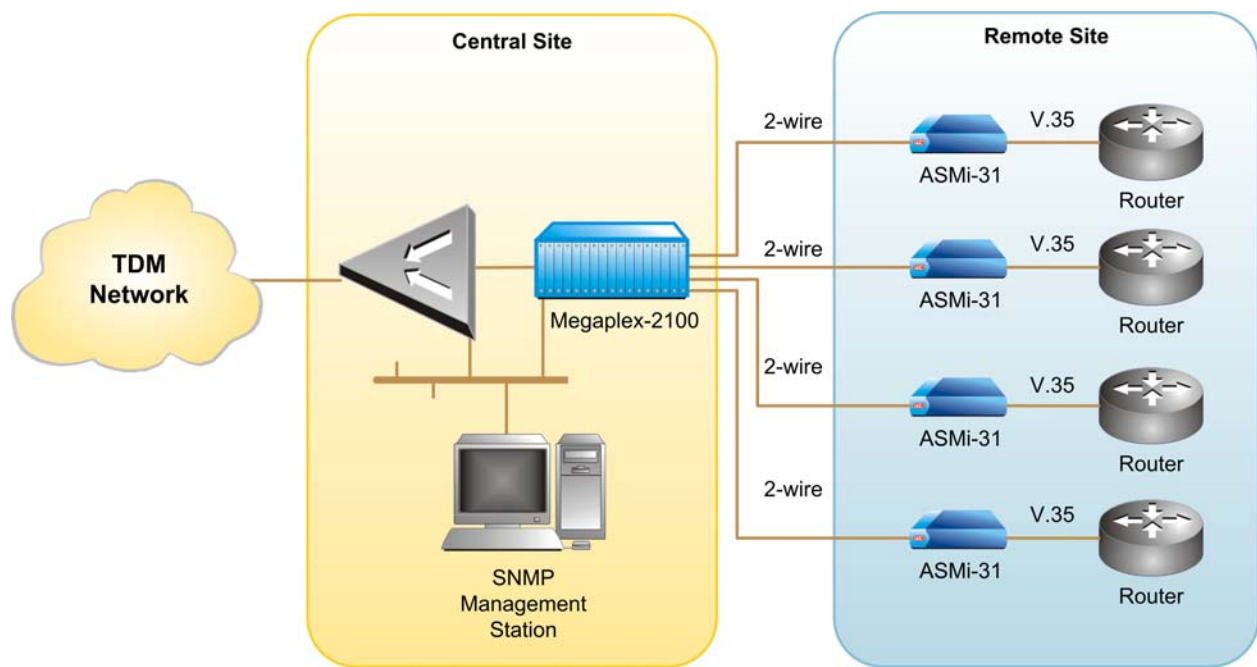


Figure 1-1. Central Site Application with SNMP Management

## Features

### Line Interface

ASMi-31 supports full-duplex transmission of 2B+D channels over 2-wire twisted pair unconditioned line. The line data rate is 160 kbps and the line coding is 2B1Q. This coding provides immunity to the background noise, eliminates normal line distortion and enables efficient transmission over 2-wire twisted cables. Using advanced adaptive echo cancellation technique, ASMi-31 supports data transmission up to 40 dB at 40 kHz and maximum resistance of 130Ω. The achieved typical range is up to 7 km (4.3 miles) over 24 AWG (0.4 mm) pairs with nominal line impedance of 135Ω. ASMi-31 line interface terminates in an RJ-45 8-pin connector.

An adaptive equalizer provides noise immunity and high performance over low quality lines.

ASMi-31 modem is coupled to the telephone lines via an isolation transformer, to protect it against overvoltages. Additional protection against lightning surges, power line contact and induction from power lines is provided by using special components on both sides of the isolation transformer. Line protection complies with the ITU K.21 requirements.

### DTE Interface

ASMi-31 modem supports the following DTE interfaces: RS-530, V.24, V.35, V.36, X.21, G.703 Codirectional (64 kbps), Ethernet bridge, Ethernet bridge with VLAN support, and IP router.

ASMi-31 supports both asynchronous and synchronous modes of DTE operation.



ASMi-31 operates at eleven selectable synchronous data rates and at eight selectable asynchronous data rates.

## Rate Adaptation

For transmission modes at user rates less than 64 kbps the ASMi-31 modem supports two methods of rate adaptation at the DTE interface to convert the user rate into a constant network rate, as specified by the ISDN BRI standard.

- Proprietary RAD method, based on encapsulation of pure data into HDLC frame (default method).
- Standard method, based on the V.110/ECMA.102 guidelines (optional).

## Transmit Timing Modes

ASMi-31 supports the following transmit timing modes:

- Internal – ASMi-31 uses the internal crystal as clock source.
- External – ASMi-31 uses the internal crystal system synchronized by the external clock coming from the DTE interface.
- Receive – Clock is recovered from the received signal.

## Clock Modes

The ASMi-31 modem may be configured to operate in the master or in the slave clock mode.

- In the **slave** clock mode the clock rate is recovered from the line, and the modem must be set to LBT (loopback timing).
- In the **master** clock mode the modem provides the clock rate to the system and is set to either INT (internal clock) or EXT (external clock) mode. If the EXT clock mode is selected, the unit, after it detected and measured the “legal” clock (clock supported by the unit), configures itself and the remote unit at the proper data rate.

### *Auto External Clock Concept of ASMi-31*

When the ASMi-31 modem is in EXT clock mode, it automatically switches itself to the Auto External Clock mode. In this mode the modem identifies the correct baud rate and synchronizes the system clock by the external clock. This condition is called the Steady state.

The modem should pass through the following “states” or phases, two of which are quite intricate, in order to recognize and configure itself to the external clock i.e. to reach the Steady state:

1. Initial state: when the user selects the EXT RCV mode, the modem is switched to Pseudo-Internal mode and sends the proper message to the remote modem.
2. Detection state: the modem tries to detect and measure the external clock coming from the DTE.
3. Deduction state: if the clock rate is detected as valid, ASMi-31 continues to the next phase.

If the detected clock is not valid, the modem displays the alarm and sends a message to the remote unit. The modem continues to look for the valid clock rate as long as it is in the EXT RCV mode.

4. Activation state: if the clock rate is detected as valid, ASMi-31 displays the data rate in the DTE Status screen on the LCD and sets the remote unit to the detected rate.
5. Steady state: the DTE interfaces are enabled after a delay for clock system stabilization. Data and control signals are received and transmitted to the external source. At the same time ASMi-31 continues to verify the clock rate (step 2) and if no errors found, remains in the Steady state.

If an illegal clock is received while the modem is in the clock detection process (steps 2 to 5), it may cause a loss of the current status and the modem and remote unit begin to exchange error messages.

## Control Signal Transfers

ASMi-31 supports end-to-end transfer of two control signals: DTR to DSR and RTS to DCD, except for the V.35 interface, which does not support the DTR to DSR signal.

## Remote Management

A management channel transmitted inband over the D-channel allows simultaneous remote configuration for both local and remote modems, real-time alerts on failures, diagnostic testing, and statistical information on system performance.

The operator manages both local and remote modems by accessing the front panel LCD and buttons. Both data and management are transmitted simultaneously inband without interference.

The configuration parameters are stored in non-volatile memory.

## Diagnostics

ASMi-31 contains a built-in internal BERT in async and sync mode for complete testing of the local and remote modems and data link quality, with no need for external testing equipment.

V.54 diagnostic loopbacks:

- Local analog loopback
- Remote digital loopback

The loopbacks may be activated for both the local and the remote units, by either LCD front panel switches, or through the DTE interface assigned pins.

---

**Note**

*Loopback activation from the DTE is not supported by the X.21, G.703 Codirectional or Ethernet interfaces.*

---

Real time alarms provide real time status information on the system's condition.

Alerts exist to indicate faulty conditions such as:

- Loss of management
- Loss of synchronization between modems
- NVRAM failure
- Configuration mismatch.

## Compatibility

The ASMi-31 standalone unit is compatible with the following products:

- ASM-31
- ASMi-31 with half-duplex management
- SRM-31
- MP-2100 HS-U card

ASMi-31 is compatible with its older versions. When the modem operates opposite ASMi-31 units with the half-duplex management, the new product features will be disabled (for example, the full-duplex management will be unavailable).

For the instructions on making ASMi-31 compatible with the older products, refer to [Making ASMi-31 Compatible with Older Products](#) in Chapter 2.

---

## 1.2 Physical Description

ASMi-31 is available as a standalone unit or as a rack-mount card for the ASM-MN-214 hub. [Figure 1-2](#) shows the 3D view of the ASMi-31 master standalone unit.



*Figure 1-2. ASMi-31/M Unit*

The front panel includes eight LEDs, which display the status of power, data flow, control signals and diagnostics. The LCD together with three buttons is used to display status (alarm) messages, and diagnostics of ASMi-31/M. You can also use the LCD and buttons to configure the unit. For details, refer to [Chapter 3](#) and [Chapter 4](#).

The back panel includes a power connector (AC or DC), a DTE interface connector, and line connectors. The ASMi-31 rear panel is described in greater detail, in [Chapter 2](#).

## 1.3 Functional Description

This section contains functional descriptions of the ASMi-31 circuit blocks, shown in *Figure 1-3*.

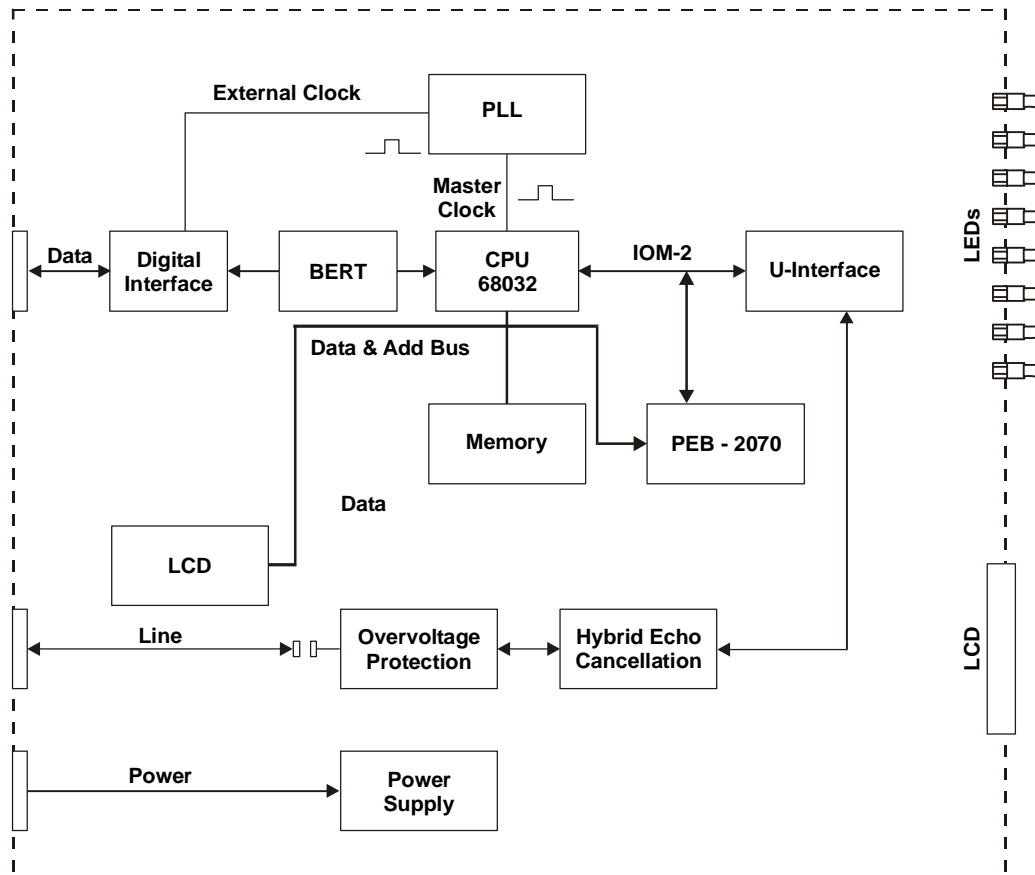


Figure 1-3. ASMi-31 Block Diagram

- **Digital interface** – An interchangeable module which translates the received and transmitted data from TTL levels to any combination of DTE interfaces supported by the modem.
- **CPU MC68302** – This processor handles the following functions:
  - Derive command information from and to management channel via D-channel to change the status and the configuration of the remote unit (ASMi-31).
  - Handle the serial bus protocol for the U-interface.
  - Monitor and command.
  - Activate and deactivate alarms and diagnostics signals.
  - Receive data incoming from the DTE interface, either encapsulated or rate adapted (for rates lower than 64 kbps), and send the data by serial bus to the U-interface. Compute the same in the reverse direction.
  - Drive LEDs to indicate status and failure conditions.
  - Read and carry out command signals arriving from the DTE interface.

- **Memory (NOVRAM)** – New configurations of the local and remote units are saved by the CPU in the Non Volatile Random Access Memory (NOVRAM). CPU requires other memory devices, such as EPROM, for proper functioning.
- **PLL** – The Phased Locked Loop (PLL) serves to synchronize the fast clock generated by the internal oscillator with the external clock derived from the DTE interface. This module is active only while the modem clock is set to EXT mode.
- **U-interface** – The U-interface handles the following functions:
  - Scramble the data received from serial bus, perform rate adaptation and transfer the scrambled and rate-adapted data to the appropriate slot in the superframe.
  - Extract line data from the superframe, descramble the data and transfer it to the serial bus.
  - Recover the clock timing from the superframe, when in LBT mode.
  - Recognize and perform commands included in the maintenance bit received from the remote unit in the superframe, such as activate/deactivate State Machine, transfer the D-channel, perform echo canceling (EC) of the data transmitted to the line, using hybrid principles.
- **Hybrid line transformer** – The EC module in conjunction with the pulse transformer form the passive line termination circuit. The circuit consists of three blocks:
  - *Hybrid network* – this is a two to four wire converter providing a limited cancellation of the near end echo.
  - *Compensation circuit* – increases the cut-off frequency in the receiver path, in conjunction with the transformer.
  - *Line pulse transformer* – allows passage of a sealing current and of phantom feed supply through the secondary winding without causing flux density saturation of the magnetic core, by being designed for low inductance.
- **BERT** – Generates an internal pseudo random 511-bit test pattern per V.52 ITU standard to test the end-to-end connectivity.
- **Power supply** – Provides power to ASMi-31.

## 1.4 Technical Specifications

Line Interface	<i>Type</i>	2-wire, full duplex operating over unconditioned lines (twisted pair), using echo cancellation
	<i>Coding</i>	2B1Q
	<i>Range</i>	Up to 7 km (4.3 miles) over a 24 AWG pair, independent of data rate according to the ANSI T1.601-1992 guidelines
	<i>Levels</i>	<ul style="list-style-type: none"> <li>Up to 14 dBm, assuming a 135<math>\Omega</math> load</li> <li>Between 13 dBm and 14 dBm over the 0 Hz–80 kHz frequency band (ANSI T1.601-1992 5.3.2.2)</li> </ul>
	<i>Standard</i>	Complies with ANSI T1.601.1988 specifications
	<i>Power Spectral Density</i>	<ul style="list-style-type: none"> <li>1 kHz to 50 kHz = -30 dB/Hz</li> <li>50 kHz to 500 kHz = -50 dB/decade</li> <li>Over 500 kHz = -80 dB/Hz (ANSI T1.601-1992 5.3.2.1)</li> </ul>
	<i>Connector</i>	RJ-45 and 3-clip terminal block
	<i>Return Loss</i>	<ul style="list-style-type: none"> <li>1 kHz – 0 dB</li> <li>10 kHz to 25 kHz – 20 dB</li> <li>250 kHz – 0 dB</li> </ul>
DTE Interface	<i>Protection</i>	According to ITU K.21 requirements
	<i>Types and Connectors</i>	<ul style="list-style-type: none"> <li>V.24: 25-pin, D-type, female</li> <li>V.35: 34-pin, female</li> <li>X.21: 15-pin D-type, female</li> <li>RS-530: 25-pin, D-type, female</li> <li>V.36: via adapter cable converting between RS-530 connector and 37-pin, D-type, female connector</li> <li>G.703 Codirectional: 5-clip terminal block or RJ-45</li> </ul>
		<p><b>Note:</b> For the G.703 codirectional interface, byte synchronization is not kept end-to-end. A violation bit is inserted every eight bits, but it does not appear in the same location at the remote end.</p>
		<ul style="list-style-type: none"> <li>IR-ETH: RJ-45</li> <li>IR-IP: RJ-45</li> </ul>

	<i>Protocol</i>	Synchronous or asynchronous
	<i>Data Rates</i>	<ul style="list-style-type: none"> <li>• Synchronous: 1.2, 2.4, 4.8, 9.6, 16, 19.2, 32, 38.4, 48, 64, 128 kbps</li> <li>• Asynchronous: 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbps</li> </ul>
<b>Note</b>	<i>16, 32, 57.6, 115.2 and 128 kbps are applicable only with RAD proprietary rate adaptation method. The modem operates also at 56 kbps (V.110 adaptation only).</i>	
	<i>Async Format</i>	<ul style="list-style-type: none"> <li>• Number of data bits – 5/6/7/8 bits,</li> <li>• Parity – odd, even or no parity,</li> <li>• Number of stop bits – 1 or 2</li> </ul>
<b>Note</b>	<i>5 bits and 6 bits are not available for the RAD proprietary rate adaptation mode.</i>	
<b>Timing</b>	<i>Clock Combinations</i>	INT–RCV, RCV–INT, EXT AUTO–RCV, RCV–EXT AUTO
	<i>Master Clock</i>	<ul style="list-style-type: none"> <li>• Internal oscillator is used to receive data from the DTE and to transmit data to the line.</li> <li>• External clock from the DTE is used to receive data from DTE and to transmit data to the line. If the X.21 interface is used, the same clock is used to receive and transmit data.</li> </ul>
	<i>Slave Clock</i>	<ul style="list-style-type: none"> <li>• Receive clock derived from the receive signal, looped back as a transmit clock</li> </ul>
<b>Diagnostics</b>	<i>V.54 Loopbacks</i>	<p>Local loopback (LLB): activated by management software or by the DTE interface signal (V.24, V.35 and RS-530 only)</p> <p>Remote loopback (REM): activated by management software or by the DTE interface connector signal (V.24, V.35, and RS-530 only)</p>
	<i>Internal BERT</i>	Built-in pattern generator and tester, complies with ITU V.52
	<i>LEDs Check</i>	Activates the local LEDs for a 3-second period, from the front panel
<b>Indicators</b>	<i>PWR (green)</i>	Power
	<i>RTS (yellow)</i>	Request to Send
	<i>TD (yellow)</i>	Transmit Data
	<i>RD (yellow)</i>	Receive Data
	<i>DCD (yellow)</i>	Data Carrier Detect
	<i>TST (red)</i>	Test
	<i>ALM (red)</i>	Alarm
	<i>SYNC ((green/red)</i>	Sync Status

<b>Physical</b>	<b><i>ASMi-31</i></b>	
	<i>Height</i>	4.4 cm (1.7 in)
	<i>Width</i>	21.5 cm (8.5 in)
	<i>Depth</i>	24.3 cm (9.6 in)
<b>Power</b>	<i>Weight</i>	1.5 kg (3.0 lb)
	<i>Wide-range power supply</i>	100 to 240 VAC, 50 to 60 Hz or -48 VDC nominal (-40 to -72 VDC)
	<i>DC only power supply</i>	24 VDC
	<i>Power Consumption</i>	5W
<b>Environment</b>	<i>Temperature</i>	0°–50°C (32°–122°F)
	<i>Humidity</i>	Up to 90%, non-condensing



# Chapter 2

---

## Installation and Setup

---

### 2.1 Introduction

This chapter describes installation and setup procedures for the standalone ASMi-31 modem.

ASMi-31 is delivered completely assembled. It is designed for tabletop or 19-inch rack installation. For rack installation instructions, refer to the rack mounting kit for 19-inch racks guide that comes with the RM kit.

After installing the unit, refer to [Chapter 4](#) for configuration instructions. In case a problem encountered, refer to [Chapter 5](#) for test and diagnostic instructions.



Internal settings, adjustment, maintenance, and repairs may be performed only by a skilled technician who is aware of the hazards involved.

Always observe standard safety precautions during installation, operation, and maintenance of this product.

#### **Note**

*Before installing the product, review [Handling Energized Products](#) at the beginning of the manual.*

---

### 2.2 Site Requirements and Prerequisites

ASMi-31 should be installed within 1.5m (5 ft) of an easily accessible grounded AC outlet that furnishes 100 VAC to 240 VAC or a -48 or 24 VDC power source, which must be adequately isolated from the mains supply.

Allow at least 90 cm (36 in) of frontal clearance for operating and maintenance accessibility. Allow at least 10 cm (4 in) clearance at the rear of the unit for signal lines and interface cables.

The ambient operating temperature of ASMi-31 is 0° to 50°C (32° to 122°F) at relative humidity of 90%, non-condensing.

---

## 2.3 Package Contents

The ASMi-31 package includes the following items:

- One ASMi-31 unit
- Last Mile Access and Intelligent Modems CD
- CBL-530/449 adapter cable for the ASMi-31 units with V.36 interface
- AC/DC power plug
- RM-28 rack mount kit (if ordered).

---

## 2.4 Equipment Needed

ASMi-31 is a standalone device intended for tabletop or 19-inch rack installation. It is delivered completely assembled. No provision is made for bolting the unit on the tabletop.

The only equipment needed for installing ASMi-31 is a small screwdriver.

---

## 2.5 Setting Internal Jumpers

ASMi-31 contains internal jumpers (JP10 and JP11) that allow you to connect or isolate the signal ground from the chassis ground and define unit's compatibility. [Figure 2-1](#) shows jumper locations. [Table 2-1](#) lists their possible settings.



Access to the inside of the equipment is permitted only to the authorized and qualified personnel.

To avoid accidental electric shock, always disconnect the interface cables and the power cord before removing the unit from its casing.

Line voltages are present inside ASMi-31 when it is connected to power and/or the lines. Moreover, under certain fault conditions, dangerous voltages may appear on the lines connected to the unit.

Any adjustment, maintenance and repair of the opened instrument under voltage must be avoided as much as possible and, when inevitable, should be carried out only by a skilled technician who is aware of the hazard involved. Capacitors inside the unit may still be charged even after the unit has been disconnected from its source of power.

---

**Caution** ASMi-31 contains components sensitive to electrostatic discharge (ESD). To prevent ESD damage, avoid touching the internal components. Before moving the jumpers, touch the ASMi-31 frame.

---

► **To configure the ASMi-31 jumpers:**

1. Disconnect all cables from ASMi-31.
2. Locate and open a lid on the bottom panel at the rear of the ASMi-31 modem.
3. Set internal jumpers, according to [Table 2-1](#).
4. Close the bottom panel lid.

Now you can proceed with the line, DTE and power connections as described below.



**Warning**

Setting JP10 to DIS may invalidate the safety of connection to telecommunication networks where permanent hazardous voltages are present on the lines.

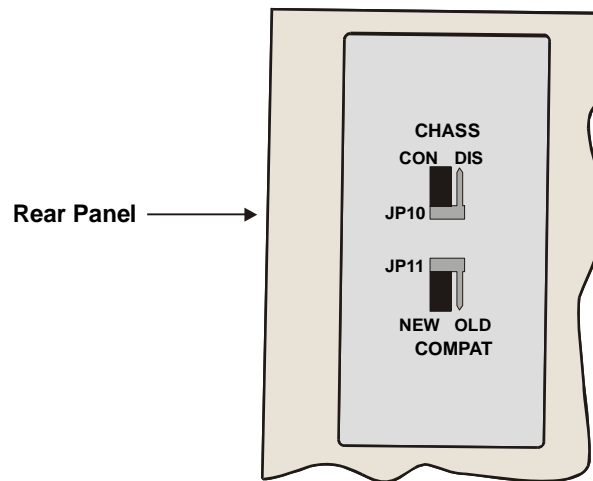


Figure 2-1. JP10 and JP11 Jumper Locations

**Caution** ASMi-31 also contains additional jumpers and switches, which are factory-set and must not be moved by the user.

Table 2-1. Jumper Settings

Jumper	Function	Possible Settings (default settings in bold)
JP10, CHASSIS	Controls connection between signal ground and chassis ground	<b>CON</b> – Signal ground is connected to chassis ground DIS – Signal ground is isolated from the chassis ground
JP11, COMPAT	Controls the ASMi-31 compatibility with the older products. See <a href="#">Making ASMi-31 Compatible with Older Products</a> below	<b>NEW</b> – All the features of the unit's current version are enabled OLD – The unit's new features are disabled. ASMi-31 is fully compatible with older products.

## 2.6 Connecting the Interface Cables

Figure 2-2 illustrates the AC-powered ASMi-31 unit rear panel.

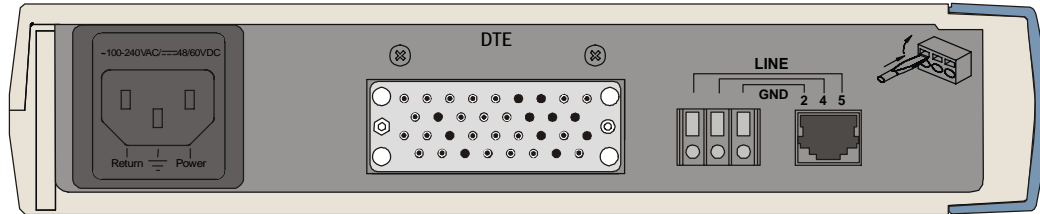


Figure 2-2. ASMi-31 Rear Panel (AC Version)

### Connecting the Line

The ASMi-31 line interface terminates in a 3-clip terminal block connector and RJ-45 connectors. The terminal block has two connecting terminals: for transmit wire and for receive wire on the twisted pair. It is marked LINE for the two wires and GND for an optional connection of the shield to chassis ground. The 2-wire line connection is not sensitive to polarity. It is highly recommended to use good quality twisted pair cable to prevent crosstalk.

► **To connect line to the terminal block:**

1. Insert the screwdriver into a square hole.

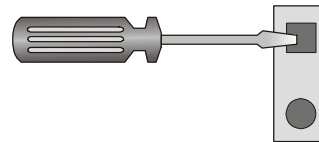


Figure 2-3. Connecting the Terminal Block – Step 1

2. Raise the inserted screwdriver, putting pressure on the ramp within the square hole.

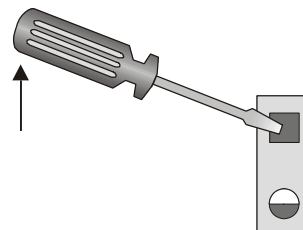


Figure 2-4. Connecting the Terminal Block – Step 2

3. Insert the stripped end of the wire and remove the screwdriver.

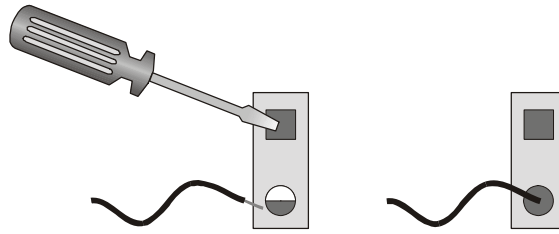


Figure 2-5. Connecting the Terminal Block – Step 3

## Connecting the DTE

The rear panel DTE connector provides interface for data input/output, clock reference and control signal exchange between ASMi-31 and the DTE. RAD offers interface cables for the DTE connection, refer to [Table 2-2](#) for the DTE interface connector description.

Table 2-2. DTE Interfaces and Matching Connector Cables

DTE Interface	Description	RAD Cable
V.24/RS-232	25-pin, D-type, female (see <a href="#">Appendix A</a> for the connector pinout)	CBL-HBT/V24
V.35	34-pin, female (see <a href="#">Appendix A</a> for the connector pinout)	CBL-HBT/V35
RS-530	25-pin, D-type (see <a href="#">Appendix A</a> for the connector pinout)	CBL-HBT/RS-530
V.36	Via adapter cable converting between RS-530 connector and 37-pin, D-type, female connector (see <a href="#">Appendix A</a> for the cable pinout)	CBL-530/449
IR-X21	15-pin, D-type (see <a href="#">Appendix A</a> for the connector pinout)	CBL-HBT/X21
IR-G.703/CO	5-clip terminal block or RJ-45 (see <a href="#">Appendix D</a> for the module description)	
IR-ETH	RJ-45 or BNC (see <a href="#">Appendix B</a> for the module description)	
IR-IP	RJ-45 (see <a href="#">Appendix C</a> for the module description)	

## Making ASMi-31 Compatible with Older Products

ASMi-31 is compatible with the older products: ASM-31, SRM-31, and MP-2100 HS-U cards or ASMi-31 units with half duplex management.

- **To make ASMi-31 compatible with the older products:**
  1. Verify that JP11 is in the NEW position and power up ASMi-31.
  2. Configure ASMi-31 the modem by its front panel buttons.
  3. Turn off the power.
  4. Set the JP11 jumper to the OLD position.
  5. Connect the line and DTE interface.
  6. Turn on the power.

---

## 2.7 Connecting the Power

---

**Note** Before installing the product, review [Handling Energized Products](#) at the beginning of the manual.

---

The ASMi-31 power inlet can accept either 100 to 240 VAC or -40 to -72 VDC (-48 VDC nominal) or 24 VDC without changing any settings.

---

**Note** ASMi-31 is supplied with either a straight or 90° angled power connector that is used for AC or DC power sources. For connection details, see the [DC Power Supply Connection supplement](#) included in the supplementary information on the documentation CD.

---

➤ **To connect ASMi-31 to an AC power source:**

1. Connect an appropriate approved 3-prong AC power connector to the open-end cable provided with the unit in the following manner:
  - Brown wire – Phase
  - Blue wire – Neutral
  - Yellow/Green wire – Protective earth.
2. Connect the resulting power cable to the power inlet on the ASMi-31 rear panel.
3. Connect the other end of the cable to the power source.

The unit turns on automatically upon connection to the mains.

➤ **To connect ASMi-31 to a DC power source:**

1. Locate and turn off the circuit breaker that supplies the DC branch circuit.
2. Connect the power cable to the power inlet on the ASMi-31 rear panel.
3. Connect the wires to the DC power source in the following order:
  - Connect the yellow/green wire to the protective earth bus.
  - Connect the brown wire to the positive (usually earthed) pole.
  - Connect the blue wire to the negative pole.
4. Switch on the DC power to the branch circuit.



---

Before switching on this unit and connecting or disconnecting any other cable, the protective earth terminals of this unit must be connected to the protective ground conductor of the mains (AC or DC) power cord. If you are using an extension cord (power cable) make sure it is grounded as well.

Any interruption of the protective (grounding) conductor (inside or outside the instrument) or disconnecting of the protective earth terminal can make this unit dangerous. Intentional interruption is prohibited.

---

# Chapter 3

---

## Operation

This chapter:

- Explains how to operate ASMi-31
- Describes the ASMi-31 modem controls, indicators, and functions

Installation procedures given in [Chapter 2](#) must be completed and checked before attempting to operate ASMi-31.

---

### 3.1 Turning ASMi-31 On

ASMi-31 is turned on as soon as power is connected. When power is connected, the PWR indicator lights up and remains lit as long as ASMi-31 receives power.

ASMi-31 requires no operator attention once installed, with the exception of occasional monitoring of front panel indicators. Intervention is only required when:

- ASMi-31 must be adapted to new operational requirements
- Diagnostic tests are performed.

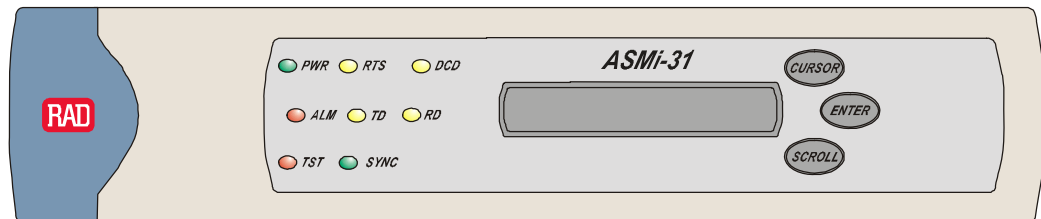
---

### 3.2 Controls and Indicators

#### Front Panel

[Figure 3-1](#) shows front panel of the ASMi-31 master modem which includes an LCD and three buttons serving for the modem configuration. A slave unit (see [Figure 3-2](#)) includes a proprietary 20-pin port for connection of the portable control unit (PCU). The removable PCU features an LCD and three buttons similar to those of the master unit.

[Table 3-1](#) lists the ASMi-31 controls, indicators and their functions.



*Figure 3-1. ASMi-31/M Front Panel*

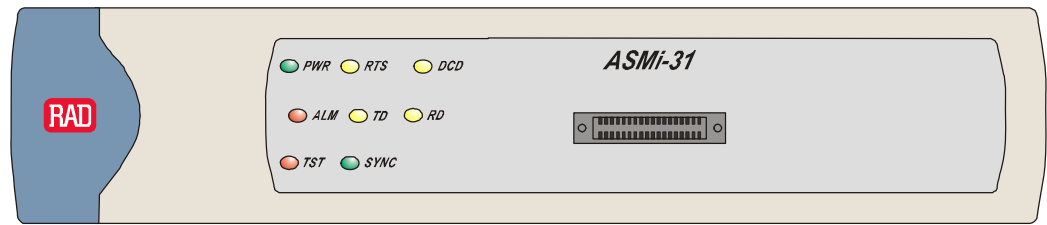


Figure 3-2. ASMi-31/S Front Panel

Table 3-1. ASMi-31 Front Panel Controls and Indicators

Name	Type	Function
PWR	Green LED	On – Power is on.
RTS	Yellow LED	On – The DTE activates Request To Send.
TD	Yellow LED	On – Steady SPACE is being transmitted. Blinks – Data is being transmitted.
RD	Yellow LED	On – Steady SPACE is being received. Blinks – Data is being received.
DCD	Yellow LED	On – A valid receive signal is present.
TST	Red LED	On – ASMi-31 is in any of the two loopback modes, or when a BER tsetting is in progress.
ALM	Red LED	On – A new alarm is detected in the alarm buffer
SYNC	Green/red LED	On (red) – The local modem's data link is not synchronized with the remote modem. On (green) – The modem's data link is synchronized with the remote modem.
LCD	Liquid crystal display	Displays messages and status information. The display contains 2 rows of 16 characters each.
CURSOR	Button	Moves among the information fields on the LCD
SCROLL	Button	Scrolls among the field options displayed on the LCD
ENTER	Button	Confirms the changes made in the ASMi-31 operation
CONTROL	Connector	Proprietary 20-pin connector for connection of PCU to ASMi-31 slave unit

## Normal Indications

*Table 3-2* shows the correct status of the indicators, a few seconds after power-up.



*Table 3-2. ASMi-31 Indicator Status*

Indicator	Status
PWR	On
LCD Display	Displays opening screen: "ASMi-31 REV x.x INITIALIZING..."
SYNC	Red
TST	Off
TD	Depends on DTE data transmission.
RD	Off
RTS	Depends on DTE RTS signal status.
DCD	Off

### 3.3 ASMi-31 Default Settings

*Table 3-3* and *Table 3-4* list default values of the line and DTE parameters.

*Table 3-3. Line Parameters*

Parameter	Default Value
CLKTYPE	INT RCV
ADAPT	RAD PROP

*Table 3-4. DTE Parameters*

Parameter	Default Value
LLB	ENABLE*
RLB	ENABLE*
MODE	SYNC
DATARATE	64K
CNT SIG-DCD	SW
CNT SIG-DSR	SW

#### **Note**

*For ASMi-31 with X.21, G.703 Codirectional and Ethernet DTE interfaces, the LLB and RLB default values are always set to DISABLE because these interfaces do not support loopback activation via DTE connector pins.*

## 3.4 Configuration Alternatives

The ASMi-31 control system enables the user to control and monitor both local and remote modems using menu-driven software. The menu concept is circular – the menu screens are displayed on the LCD one after the other in a cyclic order. A schematic description of the ASMi-31 menu tree is shown in [Chapter 4](#). This section describes the various menus and how to use them to configure ASMi-31 and display the status of the modem.

Menu options are selected by the three front-panel buttons and displayed on the LCD display. Functions of the buttons are described in [Table 3-1](#).

### LCD Structure

The ASMi-31 LCD consists of four data fields, as shown in [Figure 3-3](#).



*Figure 3-3. LCD Data Fields*

- **Menu Type** – Scrolls through the available control menus
- **Menu Options** – Indicates the control and monitoring options of each control menu
- **Parameters** – Sets the parameter for the controllable menu options
- **LOC/REM** – Enables the user to toggle between controlling and monitoring the local modem or the remote modem.

For the various menu types, the selected parameter (shown in the Parameters field) is designated by an asterisk (\*) shown at the left of the parameter. If you select a new parameter and confirm the selection (by pressing the ENTER button), the asterisk will appear at the left of the newly selected parameter.

### Control Menus

There are six main menus in the ASMi-31 management software.

- **LINE STATUS** – enables the user to display the current status of the modem with respect to clock type (CLKTYPE), rate adaptation (ADAPT), test type performed (TEST) and software version (VERSION).
- **DTE STATUS** – enables the user to display DTE data rates, interfaces, modes and formats for both the local and remote modems.
- **ALARM BUFFER** – alerts the user to modem alarms. When the ALM LED is on, the ALARM BUFFER display indicates the type of the failure. The ALM LED may blink with no relation to the ALARM BUFFER when an error is detected during the BER test.
- **CONFIG MATCHING** – enables the user to execute a fast matching of the line and DTE configuration according to the local parameters or according to the

parameters of the remote unit. This menu is active only when a line or DTE configuration mismatch occurs between the two units. For more details, refer to [Chapter 5](#).

---

**Note** *This command is not active, if the modems are not synchronized to the same clock.*

---

- **LINE CONFIG** – configures of the line parameters.
- **DTE CONFIG** – configures both local and remote modem DTE parameters.
- **TESTS** – executes several diagnostic tests on the local and remote modems.

If there are alarms stored in the alarm buffer, the device returns to the ALARM BUFFER screen and display the highest priority alarm in the buffer in the menu options field.

---

**Note** *The LINE CONFIG and DTE CONFIG menus are not available when any of the diagnostic tests is running.*

---

---

---

## 3.5 Turning ASMi-31 Off

To turn off ASMi-31, remove the power cord from the power source.



# Chapter 4

## Configuration

This chapter:

- Explains how to configure the modem
- Provides instructions for properly setting up both local and remote modems.

### 4.1 Menu Tree

The following menu tree shows how to navigate through the various menus of ASMi-31:

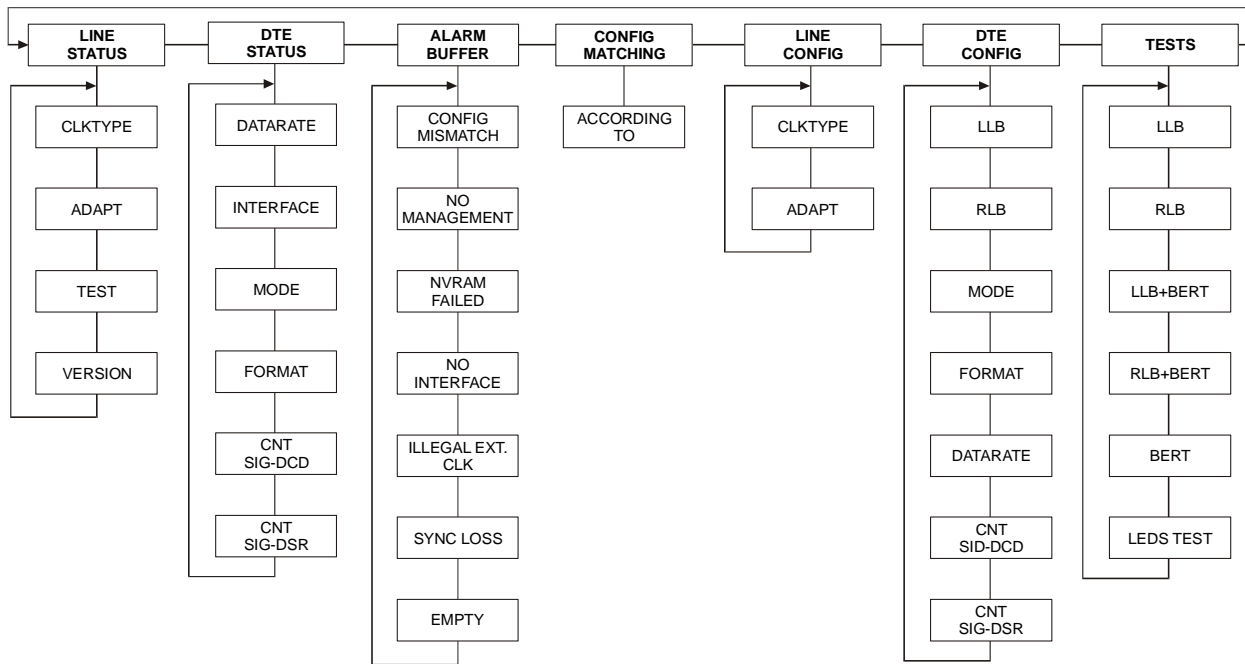


Figure 4-1. ASMi-31 Menu Tree

- Notes**
- *CONFIG MATCHING* menu is available only if there is line or DTE configuration mismatch between two modems.
  - *LINE CONFIG* and *DTE CONFIG* menus are not available when a diagnostic test is active.

---

## 4.2 Configuring Line Parameters

Menu options are selected by the three front-panel buttons and displayed on the LCD display. Functions of the buttons are described in [Chapter 3](#).

The LINE CONFIG menu allows you to configure the line parameters. You can configure both the local modem and the remote modem, provided that both modems are connected and the management is active.

When you configure a parameter, when both modems are connected and the management is active, the message "WAIT..." is displayed while the local modem sends the new settings to the remote modem and receives an acknowledgment. Once the acknowledgment is received, the message disappears and the new setting is displayed with an asterisk next to it. If only the local modem is connected, or the management is not active, you can configure only the local modem. In such a case, the message LOC CONFIG ONLY will be displayed on the LCD for a short period for each parameter you set.

If, at the time you try to configure the system, the party on the other side of the line is already modifying the configuration, the message "U R BEING CONFIG" will appear on the LCD and you will not be able to modify the system. You will only be able to modify the configuration after the other party has finished its modifications and:

- A minute has passed since the other party finished and the system returns back to LINE STATUS.

or

- The other party scrolled out of LINE CONFIG menu.

The following line parameters are available for configuration:

- Clock type
- Rate adaptation mode.

### Selecting the Clock Type

You must select the clock mode for both local and remote modem.

► **To select the clock type:**

1. Press the CURSOR button to move the cursor to the Menu Type field.
2. Press the SCROLL button until LINE CONFIG is displayed (see [Figure 4-2](#)).
3. Press the CURSOR button to move the cursor to the Menu Options field.
4. Press the SCROLL button until CLKTYPE is displayed (see [Figure 4-3](#)).
5. Press the CURSOR button to move the cursor to the Parameters field.
6. Press the SCROLL button to display the desired clock type (INT RCV, EXT RCV, RCV INT, or RCV EXT). The left column refers to the settings of the local modem, and the right column refers to the settings of the remote modem).
7. Press the ENTER button to set your choice.

If you selected the clock type to be EXT RCV, the bit rate of both the local and remote modems will be set to AUTO and this state will be displayed in the Parameters field of the DTE CONFIG, DATARATE menu.

At the same time the modem measures the frequency of the external clock. If the rate is one of those supported by the device, it is displayed in the Parameters field of the DTE STATUS, DATARATE menu. If the clock rate is not supported by the device, or no clock is provided, the Parameters field of the DTE STATUS, DATARATE menu displays AUTO and the ILLEGAL EXT CLK alarm is stored in the alarm buffer.

If the management is active, the external clock report is sent to the remote unit and also displays the same parameters as the local unit. If the management is not active, the remote unit displays the available clock rates and the operator will have to select the rate manually.

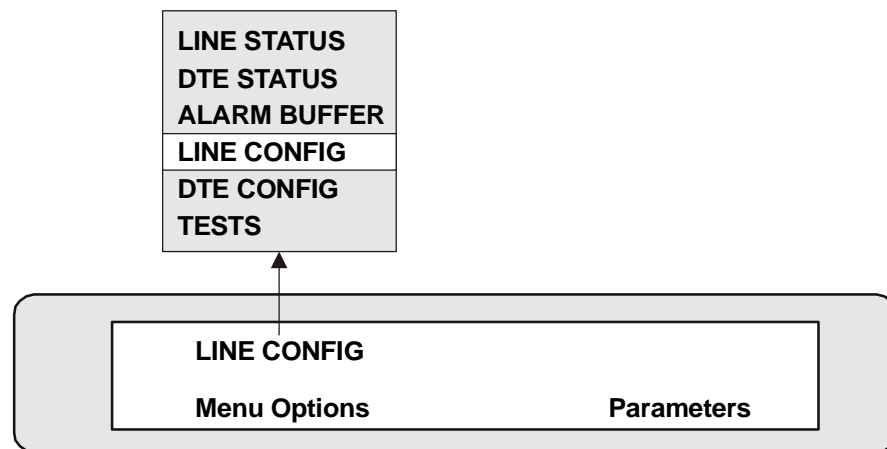


Figure 4-2. Selecting LINE CONFIG Menu

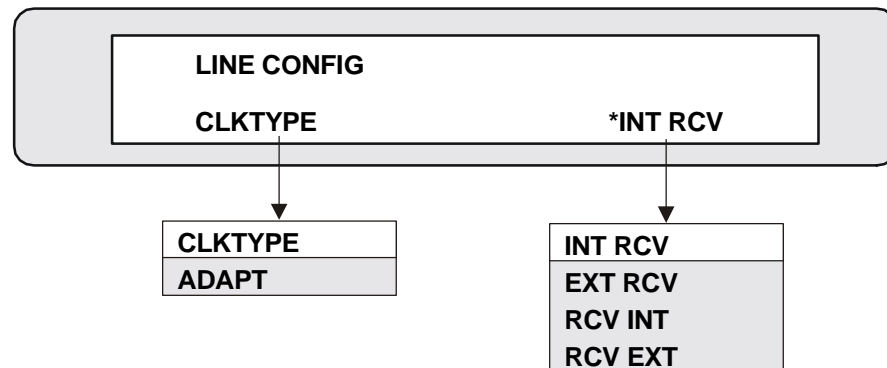


Figure 4-3. Selecting Clock Type

## Selecting the Rate Adaptation Method

ASMi-31 supports RAD proprietary and V.110 (option) rate adaptation methods.

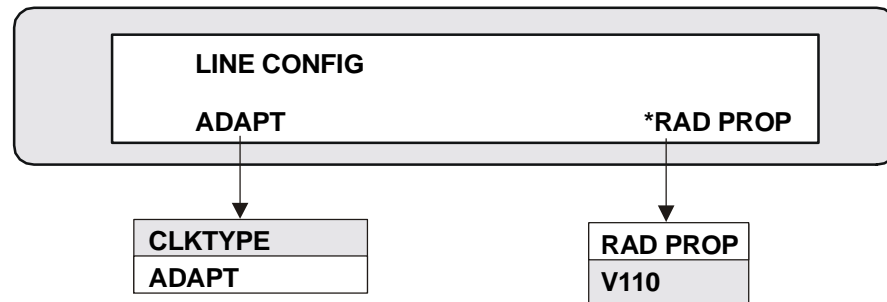
### ► To select the rate adaptation:

1. Press the CURSOR button to move the cursor to the Menu Type field.
2. Press the SCROLL button until LINE CONFIG is displayed.
3. Press the CURSOR button to move the cursor to the Menu Options field.

4. Press the SCROLL button until ADAPT is displayed (see [Figure 4-4](#)).
5. Press the CURSOR button to move the cursor to the Parameters field.
6. Using the SCROLL button, select RAD PROP or V110 and press the ENTER button to set your choice.

**Note**

*When configured to the V.110 rate adaptation, ASMi-31 operates in the internal or receive clock.*



*Figure 4-4. Selecting Rate Adaptation*

## 4.3 Configuring the DTE Parameters

The DTE CONFIG menu allows you to select ASMi-31 transmission mode (sync or async), data format for async mode, data rate, DCD and DSR signal transfer mode, and enable or disable acceptance of local/remote loopback commands from the DTE.

### Configuring Transmission Mode

ASMi-31 supports synchronous and asynchronous transmission modes.

► **To select transmission mode:**

1. Press the CURSOR button to move the cursor to the Menu Type field.
2. Press the SCROLL button until DTE CONFIG is displayed.
3. Press the CURSOR button to move the cursor to the Menu Options field.
4. Press the SCROLL button until MODE is displayed (see [Figure 4-5](#)).
5. Press the CURSOR button to move the cursor to the Parameters field.
6. Using the SCROLL button, select SYNC or ASYNC and press the ENTER button to set your choice.

**Note**

*If the current data rate fits only one mode (sync or async), and you have selected the other mode, the new configuration is not accepted and a message **ILLEGAL MODE** is displayed. In such case you must first configure the data rate and the mode will adapt to the rate and change automatically.*

*For complete list of ASMi-31 burst messages, refer to [Chapter 5](#).*



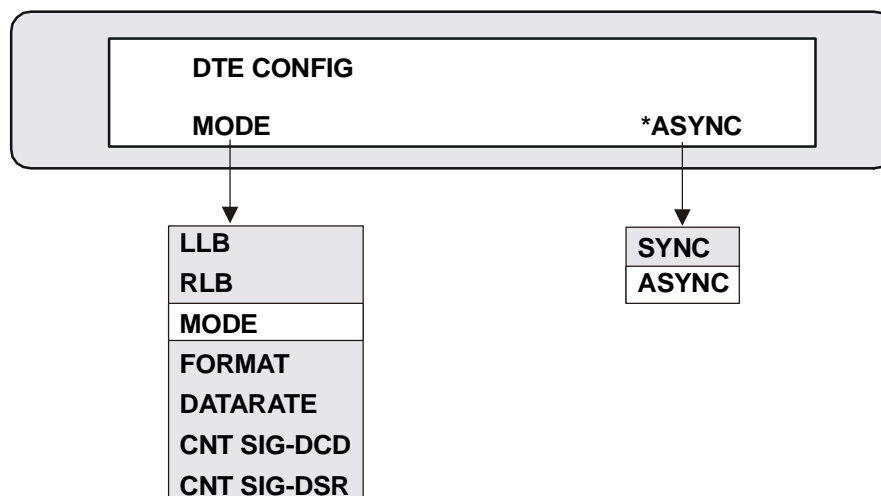


Figure 4-5. Selecting Transmission Mode

## Configuring Data Format

When operating in asynchronous mode, ASMi-31 allows you to configure the following data format parameters:

- Number of data bits
  - 7 or 8 for RAD proprietary rate adaptation method
  - 5, 6, 7 or 8 for V.110 rate adaptation method
- Parity (odd, even or none)
- Number of stop bits (1 or 2).

➤ **To select asynchronous data format:**

1. Press the CURSOR button to move the cursor to the Menu Type field.
2. Press the SCROLL button until DTE CONFIG is displayed.
3. Press the CURSOR button to move the cursor to the Menu Options field.
4. Press the SCROLL button until FORMAT is displayed (see [Figure 4-6](#)).
5. Press the CURSOR button to move the cursor to the Parameters field.
6. Using the SCROLL button, select appropriate data format and press the ENTER button to set your choice.
  - 7B NP 1S refers to 7 bits, no parity, 1 stop bit.
  - 8B EP 2S refers to 8 bits, even parity, 2 stop bits, and so on.

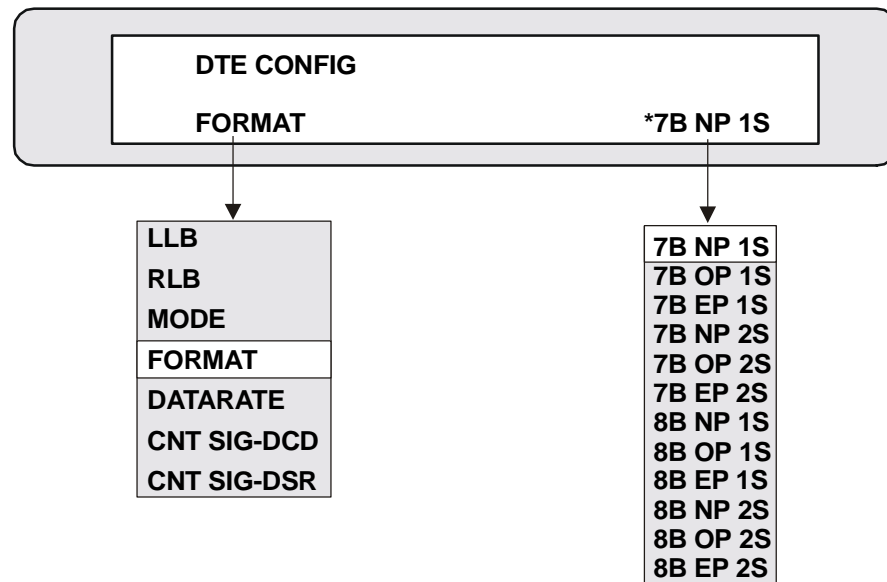


Figure 4-6. Selecting Data Format

## Selecting the Data Rate

You can select data rates for synchronous and asynchronous transmission modes. ASMi-31 allows you to select any data rate. If you choose a data rate that does not conform to the mode to which the modem was set, i.e. a sync data rate was selected for a modem set to async mode, or vice versa, then the mode automatically changes to the correct mode.

Examples:

- If the mode is async and you choose a data rate that conforms only to sync mode, i.e. 128 kbps, then the mode will automatically change to sync mode.
- If the mode is sync, the current data rate conforms only to Sync mode, and you now try to change the mode to async, then the message "ILLEGAL MODE" will appear. In such a case, to work in async mode, you must change to a data rate that can be used for sync/async transmission, or select a baud rate that conforms only to async mode, i.e. 57.6 or 115.2 kbps.

### ► To select a data rate:

1. Press the CURSOR button to move the cursor to the Menu Type field.
2. Press the SCROLL button until DTE CONFIG is displayed.
3. Press the CURSOR button to move the cursor to the Menu Options field.
4. Press the SCROLL button until DATARATE is displayed (see [Figure 4-7](#)).
5. Press the CURSOR button to move the cursor to the Parameters field.
6. Using the SCROLL button, select appropriate data rate and press the ENTER button to set your choice.

**Note**

- If you selected the clock type to be EXT RCV, the data rate of both the local and remote modems is set to AUTO and this state is displayed in the Parameters field of the DTE CONFIG, DATARATE menu.
- For units with G.703 Codirectional interface only 64 kbps data rate is available.

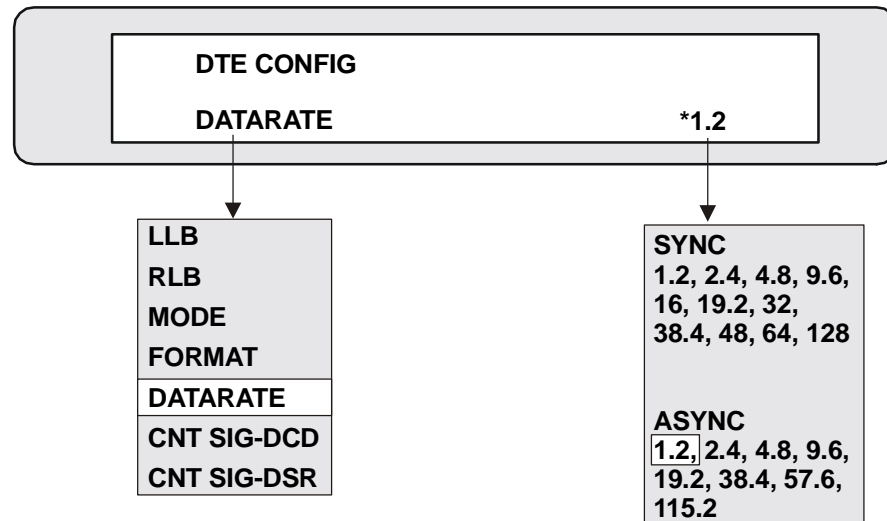


Figure 4-7. Selecting Data Rate

## Selecting DCD Mode

ASMi-31 lets you configure DCD signal to two different modes. When the two units are synchronized and the DCD is in switched mode, the DCD in the remote unit follows the RTS signal of the local unit. When the DCD is set to ON mode, the signal is active only if the two units are synchronized. It is deactivated during modem digital test or upon receipt of the RLB signal.

► **To select the DCD mode:**

1. Press the CURSOR button to move the cursor to the Menu Type field.
2. Press the SCROLL button until DTE CONFIG is displayed.
3. Press the CURSOR button to move the cursor to the Menu Options field.
4. Press the SCROLL button until CNT SIG-DCD is displayed (see [Figure 4-8](#)).
5. Press the CURSOR button to move the cursor to the Parameters field.
6. Using the SCROLL button, select SW (remote DCD follows local RTS) or ON (DCD is always ON) and press the ENTER button to set your choice.

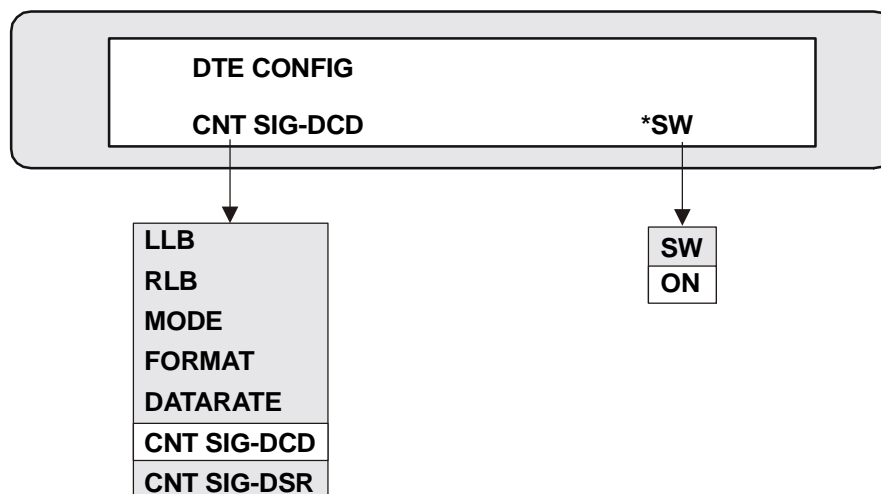


Figure 4-8. Selecting DCD Mode

## Selecting the DSR Mode

ASMi-31 lets you configure DSR signal to two different modes. When the two units are synchronized, and the DSR is in switched mode, the DSR in the remote unit follows the DTR line of the local unit. When the DSR is set to ON mode, the signal is active only if the two units are synchronized except during a digital test or while receiving BER test pattern.

► To select the DSR mode:

1. Press the CURSOR button to move the cursor to the Menu Type field.
2. Press the SCROLL button until DTE CONFIG is displayed.
3. Press the CURSOR button to move the cursor to the Menu Options field.
4. Press the SCROLL button until CNT SIG-DSR is displayed (see [Figure 4-9](#)).
5. Press the CURSOR button to move the cursor to the Parameters field.
6. Using the SCROLL button, select SW (remote DSR follows local DTR) or ON (DSR is always ON) and press the ENTER button to set your choice.

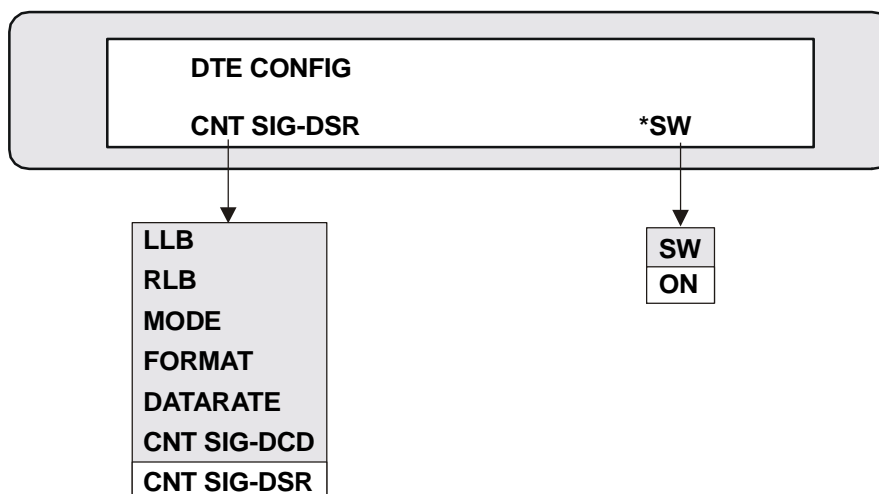


Figure 4-9. Selecting DSR Mode

## Configuring the LLB Option

The DTE can request an LLB by toggling the assigned pins of the modem's digital interface. ASMi-31 accepts and enables such a request (if the LLB option is enabled) or ignores the request (if the LLB option is disabled).

► **To configure LLB option:**

1. Press the CURSOR button to move the cursor to the Menu Type field.
2. Press the SCROLL button until DTE CONFIG is displayed (see [Figure 4-10](#)).
3. Press the CURSOR button to move the cursor to the LOC/REM field.
4. Press the SCROLL button to select the local modem or the remote modem.
5. Press the CURSOR button to move the cursor to the Menu Options field.
6. Press the SCROLL button until LLB is displayed.
7. Press the CURSOR button to move the cursor to the Parameters field.
8. Use the SCROLL button to toggle between ENABLE and DISABLE and press the ENTER button to set your choice.

When an LLB test is initiated by the DTE, the LINE STATUS, TEST menu displays DTE>LLB in the Parameters field. While this test is running, the LINE CONFIG menu and the TEST menu are masked, line parameters cannot be modified, and no other tests can be initiated. The DTE>LLB test performance will end if the LLB option is disabled, or if the DTE ends the test request. When the test is stopped, line parameters can be modified again and other tests can be initiated.

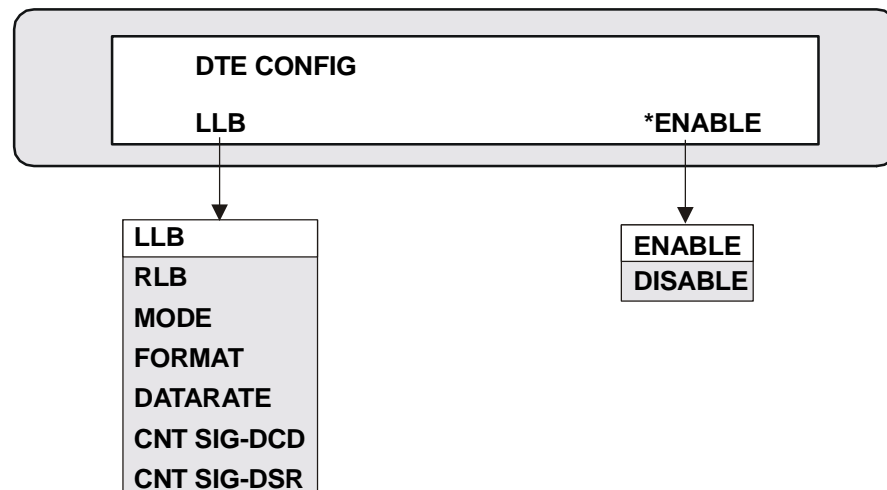


Figure 4-10. Configuring LLB Option

## Configuring the RLB Option

The DTE can request an RLB by toggling the assigned pins of the modem's digital interface. ASMi-31 accepts and enables such a request (if the RLB option is enabled) or ignores the request (if the RLB option is disabled).

► To configure RLB option:

1. Press the CURSOR button to move the cursor to the Menu Type field.
2. Press the SCROLL button until DTE CONFIG is displayed (see [Figure 4-11](#)).
3. Press the CURSOR button to move the cursor to the LOC/REM field.
4. Press the SCROLL button to select the local modem or the remote modem.
5. Press the CURSOR button to move the cursor to the Menu Options field.
6. Press the SCROLL button until RLB is displayed.
7. Press the CURSOR button to move the cursor to the Parameters field.
8. Use the SCROLL button to toggle between ENABLE and DISABLE and press the ENTER button to set your choice.

When an RLB test is initiated by the DTE, the LINE STATUS, TEST menu displays DTE>RLB in the Parameters field. While this test is running, the LINE CONFIG menu and the TEST menu are masked, line parameters cannot be modified, and no other tests can be initiated. The DTE>RLB test performance will end if the RLB option is disabled, or if the DTE ends the test request. When the test is stopped, line parameters can be modified again and other tests can be initiated.

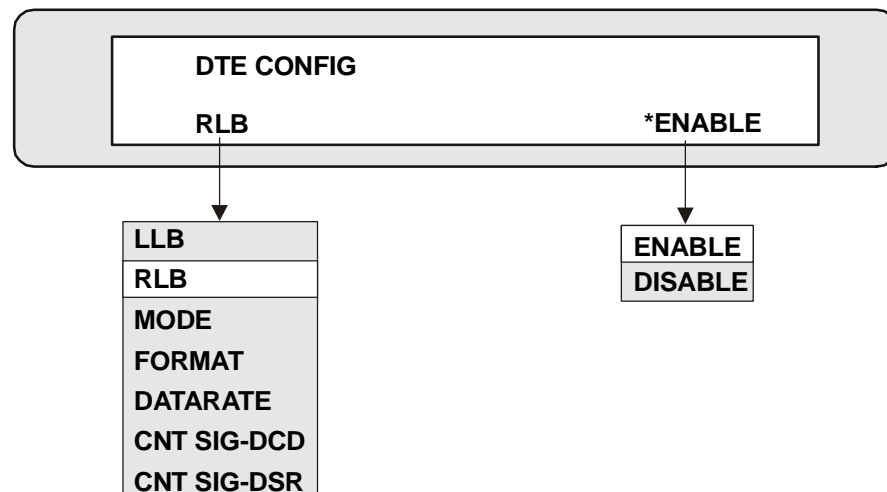


Figure 4-11. Configuring RLB Option

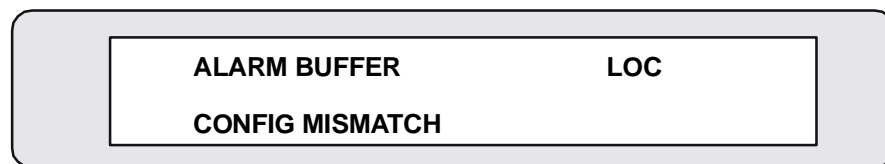
## 4.4 Matching the Line and DTE Settings of the Modems

If a mismatch in the line or DTE configuration parameters of the local and remote modems is detected, ASMi-31 initiates a CONFIG MISMATCH alarm (see [Figure 4-12](#)) and activates the CONFIG MATCHING menu. This option enables you to configure both modems with the same parameters, which were stored in one of them (user's choice) the last time it was used.

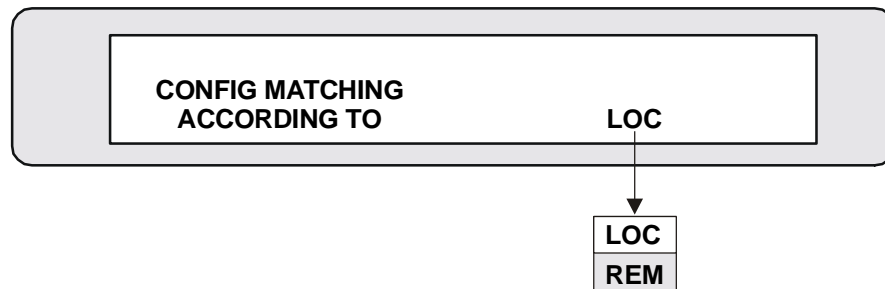
► **To match the two modems configuration:**

1. When a CONFIG MISMATCH alarm is stored in the alarm buffer, press the SCROLL button to display the CONFIG MATCHING ACCORDING TO message on LCD (see [Figure 4-13](#)).
2. Press the CURSOR button to reach the Parameters field.  
Using the SCROLL button, select the unit according to which you wish to configure both sides of the line (local or remote).
3. Press the ENTER button to configure the units (a WAIT ... message is displayed on the LCD for a short while, while the units are being configured).  
The unit returns to the ALARM BUFFER menu and the CONFIG MISMATCH alarm is erased.

The local modem stores the parameters of the last time it was configured. Some of these parameters are the parameters of the DTE interface of the local modem and the remote modem. When the CONFIG MATCHING function is employed, these parameters are set for both modems.



*Figure 4-12. CONFIG MISMATCH Alarm*



*Figure 4-13. Matching Line and DTE Configuration Parameters*

## 4.5 Displaying the Modem Status

ASMi-31 management software allows you to display the current configuration status of the line and DTE interfaces of the modem.

- Line parameters:
  - **CLKTYPE** (clock mode)
  - **ADAPT** (rate adaptation mode)
  - **TEST** (test which is currently performed)
    - NONE (no tests are active)
    - LLB (local loopback is being performed by the local unit)
    - RLB (remote loopback is being performed by the local unit)

- LLB+BERT (local loopback in conjunction with BER testing is performed by the local unit)
  - RLB+BERT (remote loopback in conjunction with BER testing is performed by the local unit)
  - DTE- >LLB (local loopback is being performed by the local DTE)
  - DTE- >RLB (remote loopback is being performed by the local DTE)
  - REMOTE TEST (a test is performed by the remote unit (to find out which specific test is run, scroll to LINE STATUS→REM→TEST).
- **VERSION** (software version).
- DTE parameters:
  - **DATARATE** (data rate)
  - **INTERFACE** (DTE interface type)
  - **MODE** (transmission mode)
  - **FORMAT** (async data format)
  - **CNT SIG-DCD** (DCD signal status)
  - **CNT SIG-DSR** (DSR signal status)
- **To display the modem status:**
  1. Press the CURSOR button to move the cursor to the Menu Type field.
  2. Press the SCROLL button until LINE STATUS or DTE STATUS is displayed.
  3. Press the CURSOR button to move the cursor to the LOC/REM field.
  4. Press the SCROLL button to select the local modem or the remote modem (if the management link is not active, remote modem is not available).
  5. Press the CURSOR button to move to the Menu Options field.
  6. Press the SCROLL button to scroll through the menu options, to one of the line/DTE parameters and its values (see [Figure 4-14](#) or [Figure 4-15](#)).



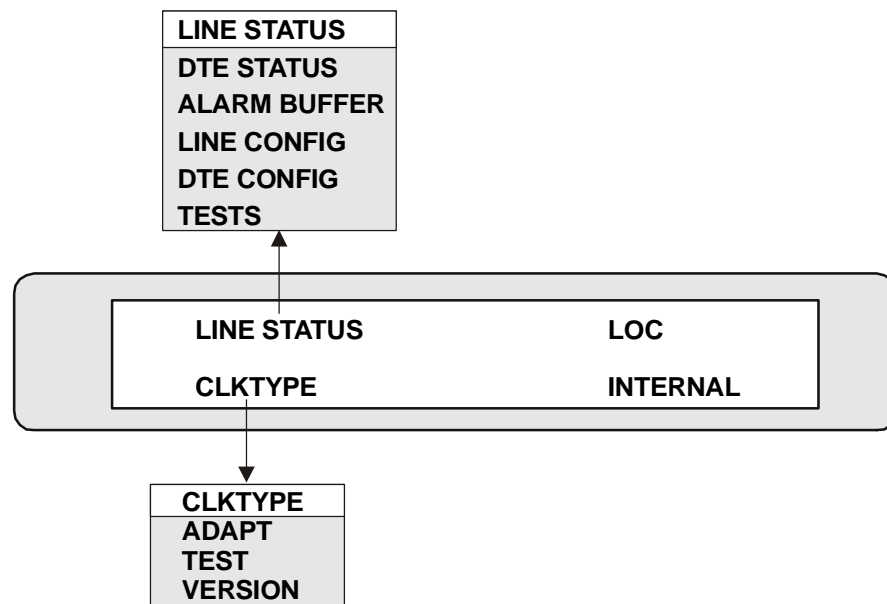


Figure 4-14. Displaying Line Status

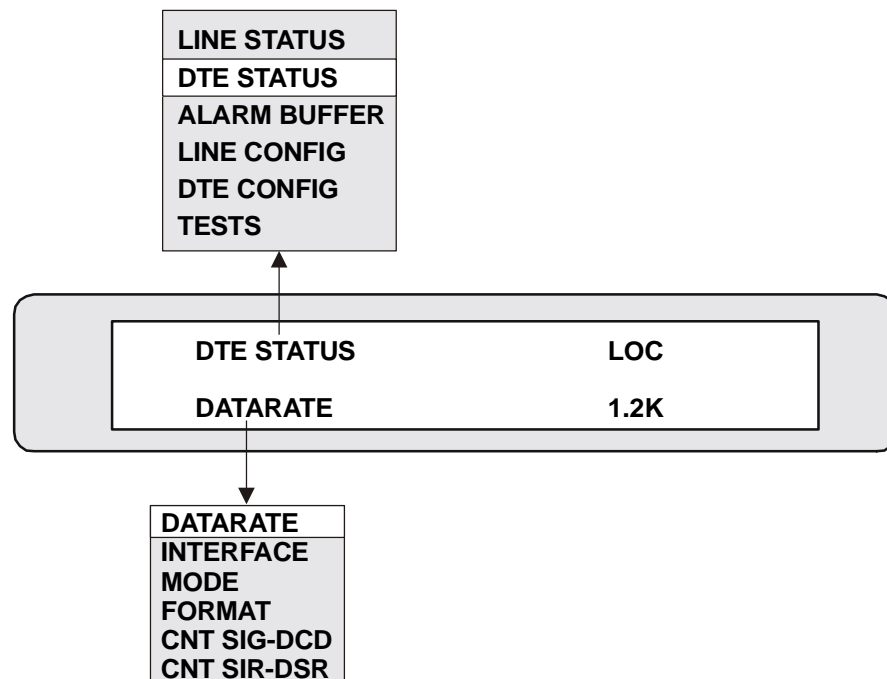


Figure 4-15. Displaying DTE Status



# Chapter 5

---

## Troubleshooting and Diagnostics

This chapter describes the ASMi-31 diagnostic functions, which include:

- Power-up self-test, status indications, burst messages, alarms
- Diagnostic tests (loopbacks and LEDs test)
- Troubleshooting instructions.

---

### 5.1 Detecting Errors

#### Power-Up Self-Test

ASMi-31 performs a hardware self-test upon turn-on. The self-test sequence checks the critical circuit functions of the modem.

#### Front Panel LEDs

The status of ASMi-31 is indicated by the TST and SYNC LED indicators located on the front panel. For the description of LEDs and their functions, refer to [Chapter 3](#).

#### Burst Messages

ASMi-31 responds, in real time, to changes in system status, as dictated by the user. The following messages will override the current menu display and appear for a period of about 2 seconds on the ASMi-31 front panel LCD (or on the PCU LCD).

- **WAIT** – The system is updating the database at this time and no other actions can be taken.
- **U R BEING CONFIG** – Parameters are being configured by the party at the other side of the line (the remote modem).
- **LOC CONFIG ONLY** – The parameter is modified on the local modem only, since the management channel is not available.
- **TEST ALREADY ON** – Activation of test is not valid because another test is performed (by local or remote modem).
- **NO AUTHORIZATION** – This message will appear if the user tries to change parameters from the standalone or ASMi-31/R modem while it is controlled via ASMi-31C or ASMi-31CQ installed in LRS-24 modem rack.

- **IR DISABLE DTE** – The user tries to initiate a loopback from DTE in a modem with an interface that doesn't support the test feature from DTE.
- **NO EXT CLK INPUT** – The user tries to change the clock type to a clock type not supported by the current DTE interface, such as change to external clock in a modem with Ethernet interface. The clock type will not change.
- **ILLEGAL MODE** – The user tries to change to an illegal mode for his current data rate. For example: to sync mode at the data rate of 57.6 kbps. The mode will not change.
- **LOC TEST ONLY** – The test is activated on the local modem only, since the management channel is not available.
- **ILLEGAL CLOCK** – The user tries to choose the illegal mode for the current clock. For example, switching to async mode is not allowed when the clock is EXT-RCV or RCV-EXT. The mode will not change.
- **CLOCK IS CHANGED** – There is a momentary loss of synchronization caused by clock type change and the user tries to change the clock type again before synchronization is achieved.
- **BERT UNAVAILABLE** – The user tries to activate internal BERT, when the modem is in async mode and number of stop bits = 2 or if the unit is configured to 5B, NP, 1s with V.110 rate adaptation.
- **NO MATCH REM** – Manually selected new parameter conflicts with one or more parameters, which are already in the database of the remote modem. For example:
  - Clock mismatch. The clock of one modem is EXT-RCV/RCV-EXT and the clock of another is RCV-INT/INT-RCV. Both units are in sync mode. The **NO MATCH REM** burst message is displayed if the user tries to change the mode of the internal clock modem to async (since it cannot be done from the external clock unit).
  - Clock mismatch. The clock of one modem is EXT-RCV/RCV-EXT and the clock of another is RCV-INT/INT-RCV. The burst message appears if the user tries to change the data rate from the INT-RCV unit (both sync or async).
  - Sync/async mode mismatch. Both modems have INT-RCV/RCV-INT clock. One unit is in sync and another is in async mode. The burst message is displayed if the user tries to change the clock type to EXT-RCV/RCV-EXT from the sync modem (since it cannot be done from the async unit).
  - Rate adaptation mismatch. One modem is in V.110 rate adaptation mode and another modem is in the proprietary RAD adaptation. The burst message appears if the user chooses data rate, which is not supported by the current rate adaptation mode of the unit.

## 5.2 Handling Alarms

ASMi-31 contains a buffer which stores the system alarms. When a record of an alarm, or several alarms are stored in the alarm buffer, the ALM LED indicator turns ON. Once the alarm buffer is cleared, the ALM LED turns OFF.

► **To display the alarm buffer contents:**

1. Press the CURSOR button to move the cursor to the Menu Type field.
2. Press the SCROLL button until ALARM BUFFER is displayed.
3. Press the CURSOR button to move the cursor to the LOC/REM field.
4. Press the SCROLL button to toggle between the local and the remote modem. If management is not active, REM (remote modem) will not be displayed.
5. Press the CURSOR button to move to the Menu Options field.
6. Press the SCROLL button to display alarms stored in the buffer (see [Figure 5-1](#)).

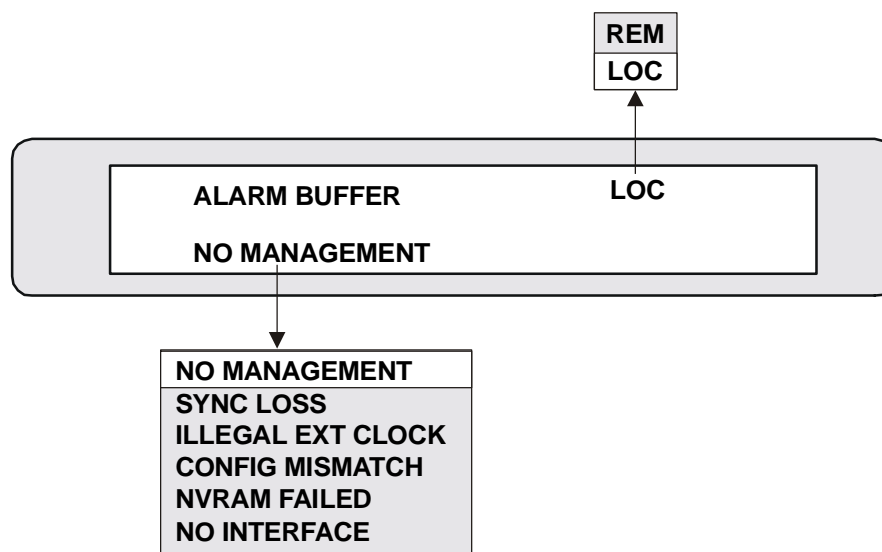


Figure 5-1. Displaying Alarms

Table 5-1. ASMi-31 Alarms

Alarm	Description
NO MANAGEMENT	Management channel is not available.
SYNC LOSS	The synchronization between the modems is lost.
ILLEGAL EXT CLK	The clock rate detected by the modem is not supported by the modem.
CONFIG MISMATCH	There is a mismatch between the line configurations of both modems.

Table 5-1. ASMi-31 Alarms (Cont.)

Alarm	Description
NVRAM FAILED	The internal modem NVRAM failed.
NO INTERFACE	The modem does not detect any DTE interface module.

### 5.3 Testing ASMi-31

The user-controlled test functions of ASMi-31 consist of the loopback tests, BERT and LEDs test. The purpose of these tests is to determine the source of a break in the data flow.

**Note** *The LINE CONFIG and DTE CONFIG menus are not available when any of the diagnostic tests is running.*

Before executing a test, note the following:

- Both local and remote ASMi-31 units must be configured and synchronized properly to allow remote loopback activation.
- Only one loopback can be activated at a time, either on the local or remote unit. The BER test can be run on both units simultaneously.

### Running Loopback Tests

ASMi-31 supports activation of the local analog and remote digital loopbacks. The loopbacks can be initiated via management software or via designated pins of the V.24, RS-530 or V.35 interfaces. The loopbacks can be run from the local and remote modems.

#### Running the Local Analog Loopback

The local analog loopback (LLB) checks the performance of the local ASMi-31 modem, the local DTE and connection between them (see [Figure 5-2](#)). The LLB can be performed separately on the local and remote modems.

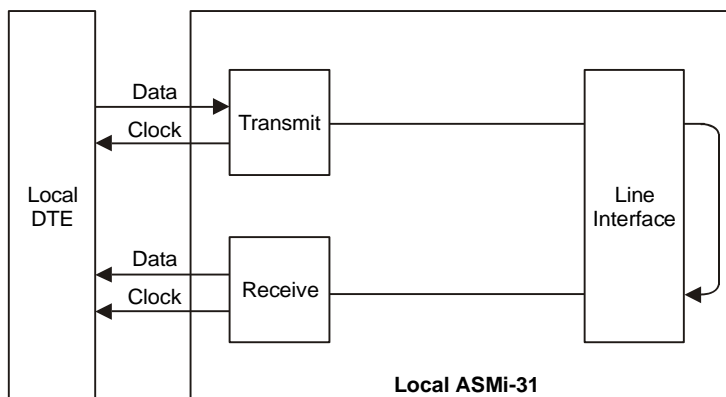


Figure 5-2. Local Analog Loopback

► **To perform the local analog loopback test:**

1. Initiate local loopback via TESTS > LLB > ON (see [Figure 5-3](#)).

The TST LED on the ASMi-31 front panel lights up. The modem's transmit output is now connected to its own receiver.

2. Execute the local analog loopback with one of the following methods:

- Using the DTE configured to the half duplex operation and checking the echoed data stream.
- Using an external BER tester.

If the BER test indicates an error-free data stream, but the DTE test indicates a fault, verify that the cable between the DTE and ASMi-31 is properly connected. If the problem persists, follow the DTE manufacturer's test procedures.

3. To isolate a communication line problem, perform the LLB loopback at the opposite end. If both LLB tests are error-free, the fault is probably in the communication line or in the line interfaces.
4. After completing the test or correcting the fault, deactivate the local loopback.

**Note**

*You can also activate the local analog loopback via the appropriate pin of the DTE interface. The loopback activation via the DTE pins is not available for the X.21, Ethernet and G.703 interfaces.*

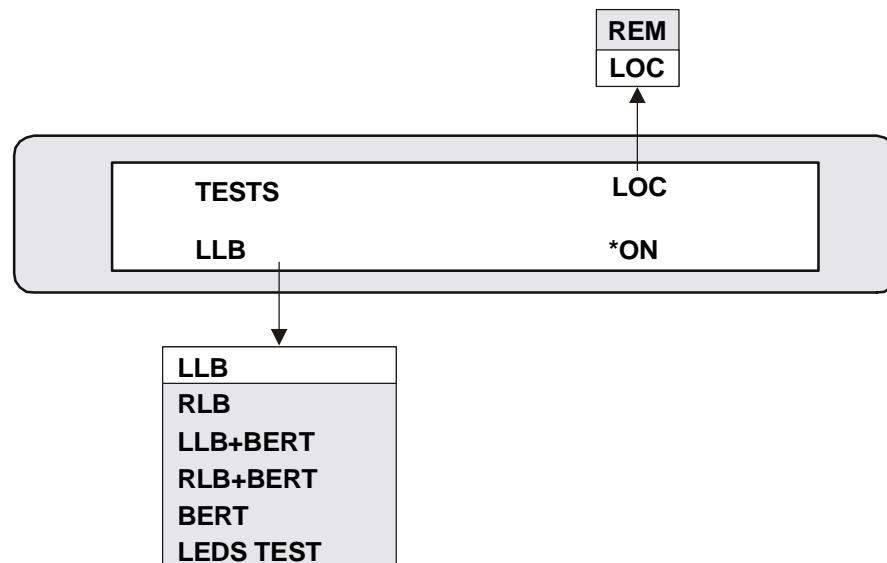


Figure 5-3. Initiating Local Loopback

## Remote Digital Loopback (RLB)

The remote digital loopback (RLB) test checks the performance of the local and the remote ASMi-31 units and their connecting lines. The RLB sets a loop at the remote ASMi-31 unit from the DTE coupled to the local unit (see [Figure 5-4](#)).

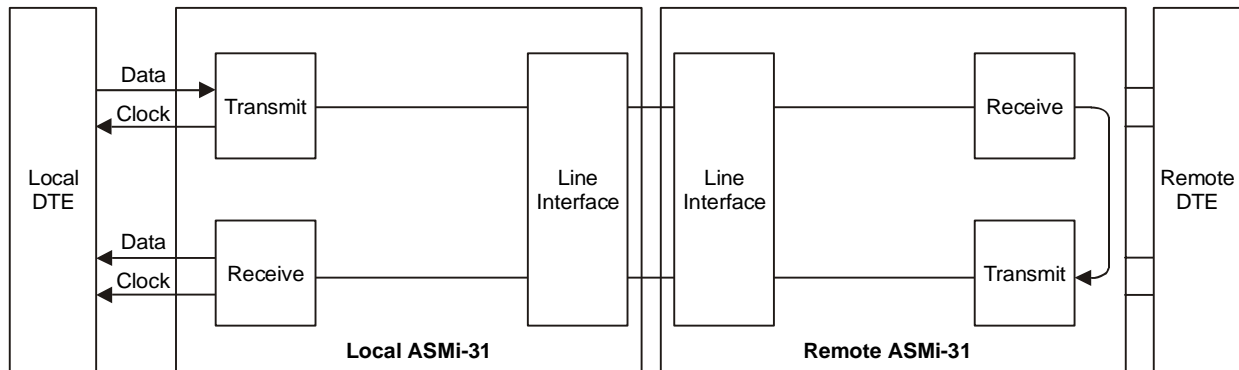


Figure 5-4. Remote Digital Loopback

► To activate the remote digital loopback:

1. Initiate remote loopback via TESTS > RLB > ON (see [Figure 5-5](#)).

The TST LED on each ASMi-31 front panel lights up. The receive output of the remote modem is looped back to the transmitter.

**Note** You can also activate the remote digital loopback via the appropriate pin of the DTE interface. The loopback activation via the DTE pins is not available for the X.21, G.703 and Ethernet interfaces.

2. Perform the RLB test as explained above for the local analog loopback test.

If an error occurs, but the local analog loopback test was successful for both the local and remote modems, it can be assumed that the line of the local or the remote unit is not operating properly.

3. After completing the test or correcting the fault, deactivate the remote loopback.

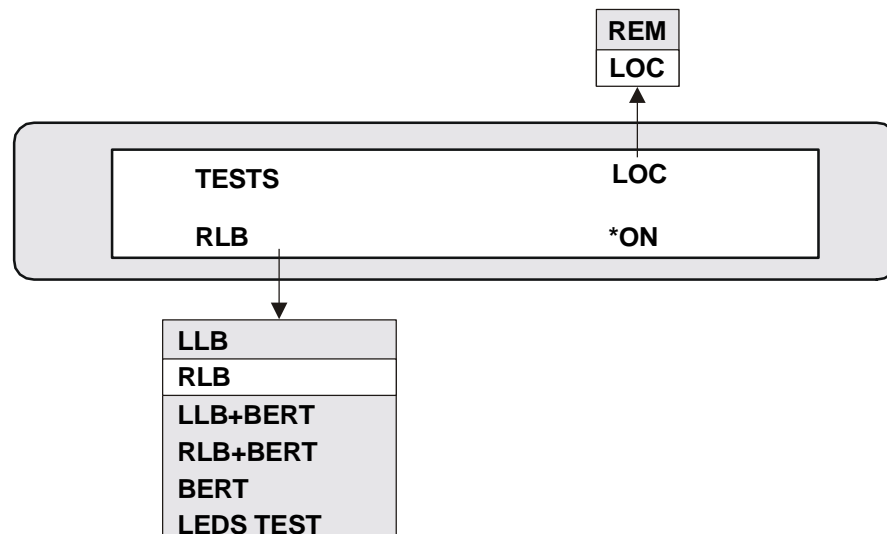


Figure 5-5. Initiating Remote Loopback



## Running the BER Testing

ASMi-31 includes an internal BER tester, which tests the line quality and calculates the bit error rate in the data stream. The ASMi-31 BERT transmits a pseudo-random 511-bit pattern according to V.52 standard. A pattern evaluator receives the pattern, compares it to the transmitted pattern and detects errors. If errors are detected by the pattern evaluator, the ALM LED blinks or remains ON.

You can run BER testing simultaneously on the local and remote ASMi-31 modems, thus checking the integrity of the link from both sides of the application at the same time (see [Figure 5-6](#)).

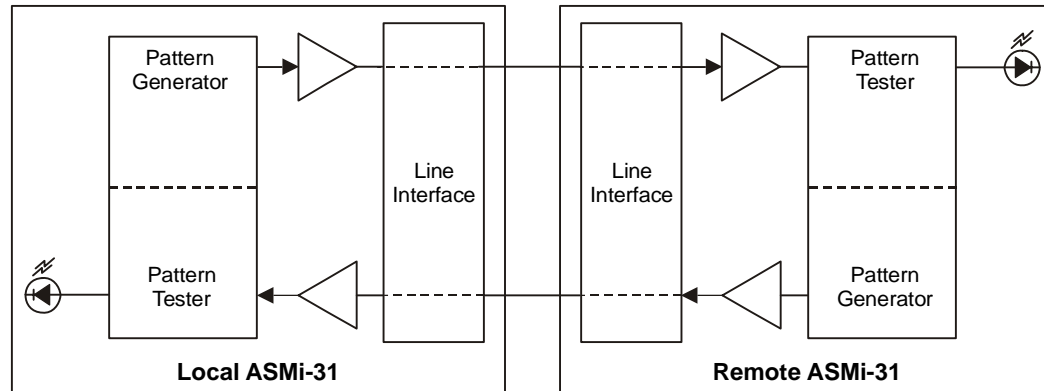


Figure 5-6. Running Two BER Tests Simultaneously

### ► To run a BER testing:

- Initiate BER testing via TESTS > BERT > ON (see [Figure 5-7](#)).

The display changes to **0.00E-7**.

If an error is detected, the ALM LED blinks and the display shows the bit error rate of the data stream.

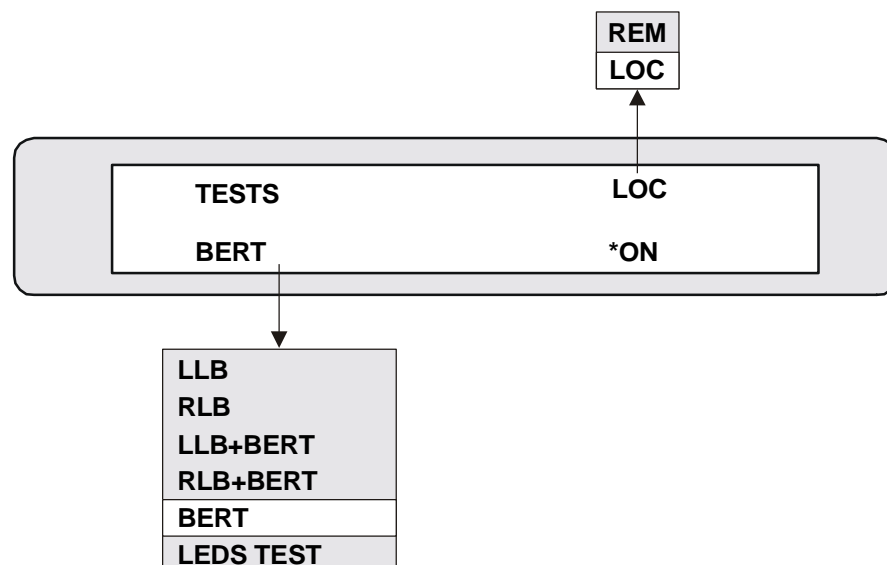


Figure 5-7. Initiating BER Testing

## Combining BER Testing with Loopbacks

You can also combine the LLB and RLB with the BER testing by activating a corresponding loopback and BERT simultaneously.

The ASMi-31 management software allows you to combine the channel or remote digital loopbacks with BERT by selecting LLB+BERT or RLB+BERT from the TEST menu.

When combining the BER testing with one of the loopbacks, an internal pattern generator connects the standard 511-bit pattern to the transmit input of the DTE interface. The receive output is connected to the pattern evaluator, which compares the received and transmitted patterns, and detects errors.

## Running the LEDs Test

The LEDs test enables you to check that the LED indicators on the modem's front panel are functioning properly.

### ► To run the LEDs test:

1. Press the CURSOR button to move the cursor to the Menu Type field.
2. Press the SCROLL button until TESTS is displayed.
3. Press the CURSOR button to move the cursor to the Menu Options field.
4. Press the SCROLL button until LEDS TEST is displayed (see [Figure 5-8](#)).
5. Press the ENTER button to start the LEDs test.

All the LEDs light briefly and then return to their normal status.

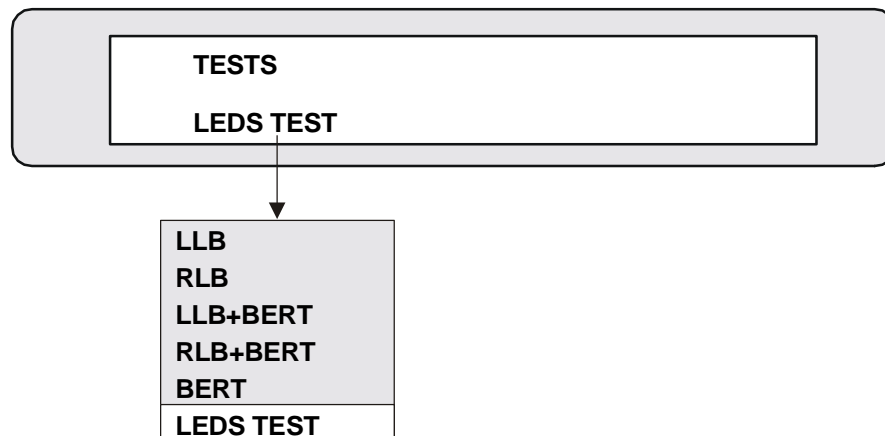


Figure 5-8. Running LEDs Test

---

## 5.4 Technical Support

Technical support for this product can be obtained from the local distributor from whom it was purchased.

For further information, please contact the RAD distributor nearest you or one of RAD's offices worldwide. This information can be found at [www.rad.com](http://www.rad.com) (offices – About RAD > Worldwide Offices; distributors – Where to Buy > End Users).



# Appendix A

## Pinouts

### A.1 V.24, V.35, X.21 and RS-530 DTE Interface Connectors

*Table A-1* lists the pin assignments of the V.24/RS-232, V.35, X.21 and RS-530 interface connectors.

*Table A-1. DTE Interface Signal Assignments*

Signal Function	V.24	V.35		RS-530	X.21		Description
	DB-25 Stand-alone and Card Cage	DB-25 Card Cage	34-Pin Standalone Pin Circuit	DB-25 Standalone and Card Cage	DB-25 Card Cage	DB-15 Standalone Pin Circuit (Function)	
Protective Ground	1	1	A Frame 101	1	1	1 (Shield)	Chassis Ground. It may be isolated from Signal Ground.
Signal Ground	7	7	B Signal 102	7	7	8 (GND)	Common signal and DC power supply ground.
Transmitted Data	2	9 11	P TD(A) 103 S TD(B) 103	2 14	2 14	2 9 (Transmit)	Serial digital data from DTE. In sync applications, the data translations must occur on the rising edge of the transmit clock.
Received Data	3	12 13	R RD(A) 104 T RD(B) 104	3 16	3 16	4 11 (Receive)	Serial output from the modem receiver. In sync applications, the data translations occur on the rising edge of the clock.

Table A-1. DTE Interface Signal Assignments (Cont.)

Signal Function	RS-232	V.35		RS-530	X.21		Description
	DB-25 Stand-alone and Card Cage	DB-25 Card Cage	34-Pin Standalone Pin Circuit	DB-25 Stand-alone and Card Cage	DB-25 Card Cage	DB-15 Standalone Pin Circuit (Function)	
Request to Send	4	4	C RTS 105	4 19	4 19	3 10 (Control)	A positive level to ASMi-31 when data transmission is desired.
Clear to Send	5	5	D CTS 106	5 13			A positive level from ASMi-31 with delay, after receipt of Request to Send, and when ASMi-31 is ready to transmit.
Data Set Ready	6	6	E DSR 107	6 22			A positive level from ASMi-31 when power is on, and ASMi-31 is (a) not in DIGITAL LOOP mode, or (b) has not received a REMOTE LOOPBACK signal from the remote unit.
Data Terminal Ready	20	20	H DTR 108	20 23			Not used
Carrier Detect	8	8	F DCD 109	8 10	8 10	5 12 (Indication)	A positive level from ASMi-31, except when a loss of the received signal is detected or when Data Set Ready is negative.
External Transmit Clock	24	19 16	U SCTE(A) 113 W SCTE(B) 113	24 11	24 11	7 14	A serial data rate clock input from the data source. Positive clock translations must correspond to data transmissions.

Table A-1. DTE Interface Signal Assignments (Cont.)

Signal Function	RS-232	V.35		RS-530	X.21		Description
	DB-25 Stand-alone and Card Cage	DB-25 Card Cage	34-Pin Standalone Pin Circuit	DB-25 Standalone and Card Cage	DB-25 Card Cage	DB-15 Standalone Pin Circuit (Function)	
Transmit Clock	15	14 10	Y SCT(A) 114 a SCT(B) 114	15 12	15 12	6 S(A) 13 S(B) (Signal timing)	A transmit data rate clock for use by an external data source. Positive clock translations correspond to data translations.
Receive Clock	17	23 22	V SCR(A) 115 X SCR(B) 115	17 9			A receive data rate clock output used by an external data sink. Positive clock translations correspond to data translations.
Local Analog Loop	18	18	L and j	18			A control signal input, which, when on, sets ASMi-31 into Local Analog Loopback (V.54 Loop 3).
Remote Digital Loop	21	21	N and h	21			A control signal input which, when on, commands ASMi-31 to send a remote Loopback command (V.54 Loop 2) to the remote ASMi-31.
Test Indicator	25	25	n and k	25			A Control Signal output from ASMi-31; positive during any test mode.

## A.2 V.36 Interface Connector

The ASMi-31 V.36 interface is provided via an adapter cable converting between 25-pin RS-530 connector and 37-pin V.36 connector. [Table A-2](#) lists the cable wiring.

*Table A-2. Cable Converting between RS-530 and V.36 Interfaces, Pin Assignment*

Signal Function	V.36		RS-530	
	Pin	Circuit	Pin	Circuit
Protective Ground	1	Shield	1	
Signal Ground	19	SG	7	AB
DTE Common Return	37	SC		
DCE Common Return	20	RC		
Transmitted Data	4	SD (A)	2	BA (A)
	22	SD (B)	14	BA (B)
Received Data	6	RD (A)	3	BB (A)
	24	RD (B)	16	BB (B)
Request to Send	7	RS (A)	4	CA (A)
	25	RS (B)	19	CA (B)
Clear to Send	9	CS (A)	5	CB (A)
	27	CS (B)	13	CB (B)
Data Set Ready	11	DM (A)	6	CC (A)
	29	DM (B)	22	CC (B)
Data Terminal Ready	12	TR (A)	20	CD (A)
	30	TR (B)	23	CD (B)
Carrier Detect	13	RR (A)	8	CF (A)
	31	RR (B)	10	CF (B)
External Transmit Clock	17	TT (A)	24	DA (A)
	35	TT (B)	11	DA (B)
Transmit Clock	5	ST (A)	15	DB (A)
	23	ST (B)	12	DB (B)
Receive Clock	8	RT (A)	17	DD (A)
	26	RT (B)	9	DD (B)
Local Analog Loopback	10	LL	18	LL
Remote Loopback	14	RL	21	RL
Test Indicator	18	TM	25	TM



### A.3 ASMi-31/R with Ethernet Interface, DTE Connection

ASMi-31/R with the IR-ETH Ethernet interface module uses a CIA/ETH interface adapter, which converts one DB-25 connector to an RJ-45 connector. If you intend to prepare a DB-25/RJ-45 adapter cable yourself, refer to [Figure A-1](#) and [Table A-3](#) for the pin designations and their assignment.

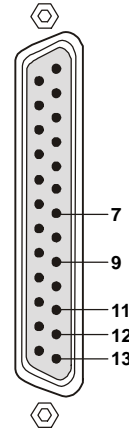


Figure A-1. Pin Designation in the DB-25 Connector of ASM-MN-214 Card Cage

Table A-3. DB-25 and RJ-45 Pinout, Ethernet

Pin		Function
RJ-45	DB-25	
3	13	RCV (+)
6	12	RCV (-)
1	11	XMT (+)
2	9	XMT (-)
-	7	GND

## A.4 ASMi-31/R with G.703 Codirectional Interface

ASMi-31/R with G.703 Codirectional interface uses an adapter cable that converts one DB-25 connector to an RJ-45 connector. Refer to [Figure A-2](#) and [Table A-4](#) for the pin designations and their assignment.

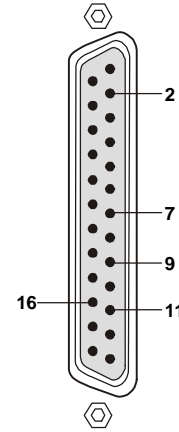


Figure A-2. Pin Designation in the DB-25 Connector of ASM-MN-214 Card Cage

Table A-4. DB-25 and RJ-45 Pinout, G.703 Codirectional

Pin		Function
RJ-45	DB-25	
3	9	RCV (+)
6	11	RCV (-)
4	2	XMT (+)
5	16	XMT (-)
2	7	GND

# Appendix B

## IR-ETH Interface Module

IR-ETH is an interface module for RAD modems, used for converting the Ethernet (10BaseT or 10Base2) electrical levels to the modem TTL levels. It also converts the Ethernet protocol to HDLC to enable long-distance transmission and avoid the Ethernet collision limitation.

IR-ETH includes an internal, self-learning Ethernet bridge, which enables a high performance link between two Ethernet segments at a low transmission rate. The low-speed HDLC transmission is sent over the link using the modem modulation technique. It is converted back to an Ethernet signal at the remote modem.

*Figure B-1* shows a typical application using an Ethernet interface bridge. Each modem is connected to an Ethernet network via the Ethernet interface bridge.

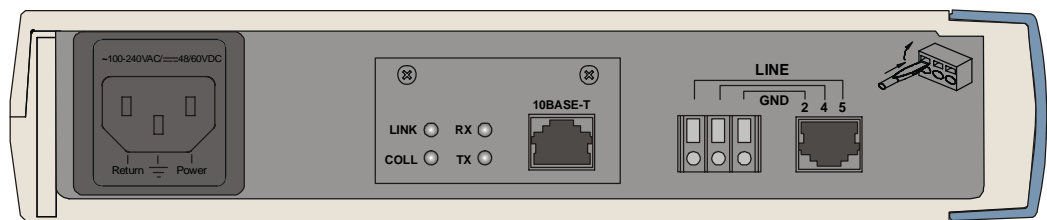


*Figure B-1. Typical Application of ASMi-31 with IR-ETH Module*

### B.1 IR-ETH Connector Options

*Figure B-2* shows the rear panel of ASMi-31 with the IR-ETH option. *Table B-1* lists the RJ-45 connector pinout.

*Appendix A* describes the pinout of the DB-25 connector serving the LAN connection of the ASMi-31/R card.



*Figure B-2. ASMi-31 Rear Panel with IR-ETH/UTP Connector*

*Table B-1. RJ-45 Connector Pinout*

Pin	Signal
3	RCV (+)
6	RCV (-)
1	XMT (+)
2	XMT (-)
–	GND

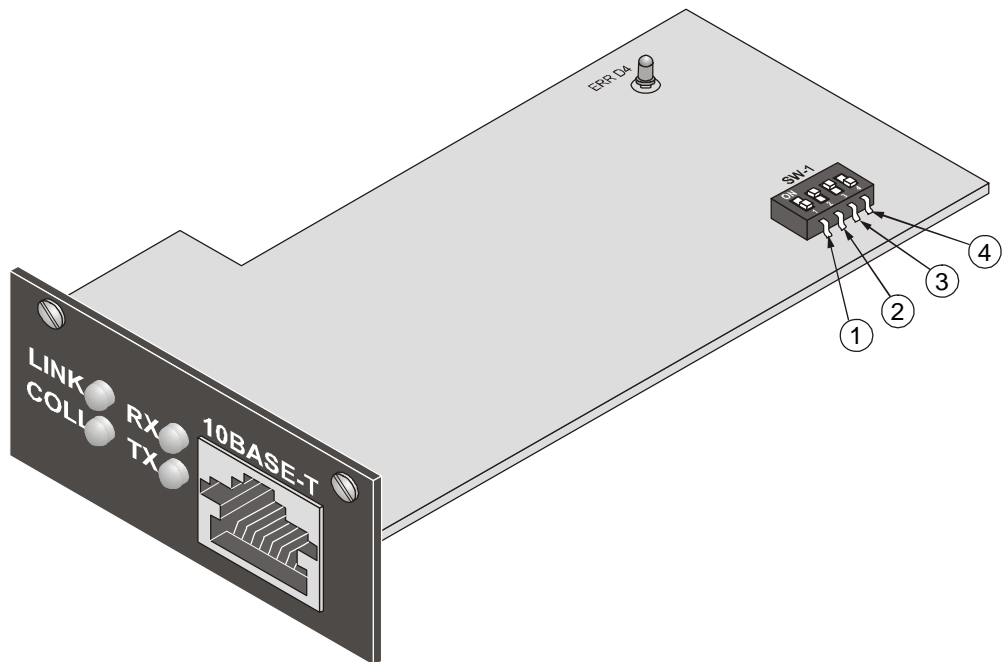
---

## B.2 Technical Specifications

<b>General</b>	<i>LAN Table</i>	10,000 addresses
	<i>Filtering and Forwarding</i>	15,000 pps
	<i>Buffer</i>	256 frames
	<i>Delay</i>	1 frame
<b>LAN</b>	<i>Standard</i>	Conforms to IEEE 802.3/Ethernet
	<i>Data Rate</i>	10 Mbps (20 Mbps 10BaseT FDX)
	<i>Connectors</i>	<ul style="list-style-type: none"> <li>10BaseT (UTP): Shielded RJ-45</li> </ul>
<b>WAN</b>	<i>Protocol</i>	HDLC
	<i>Data Rate</i>	According to the modem transmission rate

### B.3 Installation and Operation

*Figure B-3* shows the IR-ETH layout, the locations of the DIP switch, and the rear panel components for the UTP version.



*Figure B-3. IR-ETH Module Layout (UTP Option)*

#### Setting the DIP Switch

Set the IR-ETH DIP switch according to *Table B-2*.

*Table B-2. DIP Switch Settings*

Switch Number	Name	Description (Default setting in bold)
1	SQ/FD	On – Ethernet full-duplex mode <b>Off</b> – Ethernet half-duplex mode
<b>Note:</b> The SQ/FD switch is not used in the Ethernet bridge with the BNC connector option.		
2	CMP	<b>On</b> – Strips padding bits inserted in 64-byte frame Off – Transmits frames over WAN as is
3	FIL	<b>On</b> – Passes only frames destined for another LAN Off – Disables LAN filter, passes all frames transparently

## LED Indicators

*Table B-3* lists the IR-ETH LED indicators and describes their functions.

*Table B-3. IR-ETH Bridge LED Indicators*

LED Name	Description	Location	Color
LINK	ON – Good link integrity (available only in the 10BaseT version)	Panel	Green
RX	ON – Data is received from the Ethernet attached segment	Panel	Yellow
TX	ON – Data is transmitted from the modem to the Ethernet segment	Panel	Yellow
ERR D4	ON – Bridge buffer overrun occurred	On-board	Red

## Connecting the LAN

For 10BaseT installation, either a straight cable or a cross cable may be required. Use a cross cable when connecting to a port that does not implement the crossover function internally. Otherwise, use a straight cable.

---

**Note** *Hubs usually do implement the crossover function internally while network interface cards and other devices do not.*

---

# Appendix C

---

## IR-IP Interface Module

---

### C.1 Introduction

#### Overview

IR-IP is a high-performance, miniature IP router based on RAD's unique IP router chip, the ChipRouter.

IR-IP works by taking each Ethernet frame from the LAN and determining whether the IP packet is destined for the IP net on the Ethernet LAN. If not, IR-IP forwards the packet to the WAN (line) link. IP packets received from the WAN link are automatically forwarded to the LAN if the IP net matches.

IR-IP includes hardware filters which handle all filtering operations at wire speed from both LAN-to-WAN and WAN-to-LAN, without dropping a single packet. Filtering and forwarding are performed at the maximum rate of 35,000 and 30,000 frames per second (wire speed), respectively. The buffer can hold 256 frames of maximum size of 1534 bytes and a throughput latency of one frame.

IR-IP is available with 10BaseT (UTP) interface and is fully IEEE 802.3/Ethernet v2 compliant. The IR-IP interface can also operate in full duplex Ethernet applications.

ASMi-31 equipped with IR-IP interface module can be used as a Frame Relay Access Device (FRAD) with an integral IP router. RFC 1490 is supported for a single DLCI on the WAN link. Detection of the DLCI and the maintenance protocol is performed automatically. This allows the IR-IP to be used as the termination unit of IP services over Frame Relay at the customer premises, opposite a Frame Relay switch in the backbone.

Alternatively, Point-to-Point Protocol (PPP) can be run on the WAN link with automatic negotiation on power-up, as well as support for PAP and CHAP authentication. With this feature, IR-IP can operate opposite any PPP compliant access server or backbone router.

IR-IP supports HDLC, which is especially important for broadcast and multicast applications where bandwidth overhead is critical.

IR-IP supports IP multicast at wire speed, making it suitable for any multicast environment including high speed downstream environments, such as satellite and xDSL. Users on the LAN who register with IR-IP for an IP multicast group using the IGMP protocol filter IP multicast packets at wire speed.

Management and advanced configuration are performed via Telnet.

## Application

*Figure C-1* shows a typical application of the ASMi-31 modem equipped with the IR-IP interface module.



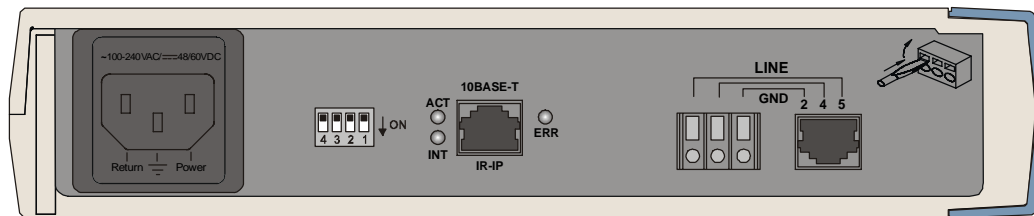
*Figure C-1. Typical Application of ASMi-31 with IR-IP*

## C.2 Technical Specifications

Router	<i>LAN IP Net</i>	Up to 256 hosts on LAN IP net
	<i>Filtering and Forwarding</i>	30 kbps/35 kbps
	<i>Buffer</i>	256 frames (maximum size – 1534 bytes)
	<i>Delay</i>	1 frame
LAN	<i>Standard</i>	Conforms to IEEE 802.3/Ethernet v2
	<i>Data Rate</i>	10 Mbps (20 Mbps 10BaseT in full duplex topology)
	<i>Connector</i>	10BaseT (UTP): Shielded RJ-45
WAN	<i>Protocols</i>	• PPP (PAP/CHAP)
		• Frame Relay (RFC 1490)
		• HDLC

## C.3 Physical Description

*Figure C-2* shows the rear panel of ASMi-31 with the IR-IP interface module.



*Figure C-2. Rear Panel of ASMi-31 with the IR-IP Module*



## IR-IP LEDs

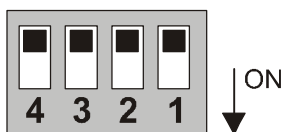
IR-IP contains three LEDs, which indicate the module activity. [Table C-1](#) lists the LEDs functions.

*Table C-1. IR-IP LEDs Functions*

Name	Type	Function
INT	Green LED	ON – LAN integrity is established.
ACT	Yellow LED	Blinks – Transmit/receive activity is detected on the Ethernet link.
ERR	Red LED	ON – Buffer overflow occurred (during normal operation). During power-up, provides additional indications, described below.

## IR-IP DIP Switch

IR-IP interface module contains a four-section DIP switch, as seen in [Figure C-3](#). [Table C-2](#) lists the DIP switch functions.



*Figure C-3. IR-IP DIP Switch*

*Table C-2. IR-IP DIP Switch Functions*

No	Function	Settings (Default settings in bold)
1	Enables IR-IP to learn its IP	On – IP address learning is enabled <b>Off</b> – IP address learning is disabled
2	Selects the WAN protocol	On – PPP protocol <b>Off</b> – Frame Relay protocol
3	Selects the LAN mode	On – Full duplex operation <b>Off</b> – Half duplex operation
4	Controls the remote WAN test loopback, which returns packets received from the WAN back toward the WAN	On – The test loopback is activated <b>Off</b> – The test loopback is disabled

[Table C-3](#) provides the pinout of the IR-IP RJ-45 connector.

*Table C-3. RJ-45 Pinout*

Pin	Name	Function
1	TD (+)	Transmit data (positive)
2	TD (-)	Transmit data (negative)
3	RD (+)	Receive data (positive)
6	RD (-)	Receive data (negative)

---

---

## C.4 Preliminary Configuration of ASMi-31 with IR-IP

Before starting configuration of the IR-IP interface module, make sure to set the following jumpers of the local and remote units as detailed below:

- RLB jumper (JP14) – DIS
- LLB jumper (JP15) – DIS
- Section 6 (DCD) of the SW6 DIP switch – ON
- Section 7 (DSR) of the SW6 DIP switch – ON.

---

---

## C.5 IR-IP Management Subsystem, General

### Introduction

The IR-IP interface module management subsystem supports the following functions:

- Preliminary configuration
- Configuration of management access parameters
- Advanced configuration of IR-IP parameters
- Collection and display of statistical performance data
- Maintenance functions, which include:
  - Software downloading
  - Resetting of various subsystems
  - Display of error log
  - Ping utility, for checking IP connectivity.

The management subsystem of the IR-IP interface module is a separate, independent entity.

The communication with the IR-IP management subsystem is made through the local LAN interface connector of the IR-IP module, designated 10BASE-T, using the Telnet protocol. Passwords can be used to prevent unauthorized access.

## Accessing the IR-IP Management Subsystem

The IR-IP interface module must be configured in accordance with the specific requirements of the user's application before it can be used in the user's network. As a result, it is not possible to supply default parameters to enable IR-IP to start service without any preliminary configuration.

Therefore, to enable the user to establish Telnet communication and configure IR-IP, IR-IP is delivered with a default set of parameters. The default parameters are automatically used:

- Before the IP router is configured by the user, e.g., when a new ASMi-31 with IR-IP interface module is put into operation
- After the user's configuration parameters have been erased.

When the factory-default parameters are used, the ERR indicator located on the ASMi-31 rear panel, near the IR-IP Ethernet interface connector flashes rapidly (about three times per second).

---

**Note** *The flashing of the ERR indicator also serves as a warning to the user that the IR-IP WAN interface does not send, nor does it receive packets, and therefore IR-IP can be accessed only from the LAN.*

---

After configuring IR-IP, it starts normal operation and routes the traffic in accordance with the user-selected configuration parameters.

To change the parameters of an already-configured IR-IP, establish communication from a Telnet host using the assigned IP address.

## Default IP Communication Parameters

The default IP communication parameters of the interface module are:

- The default IP address of the IR-IP Ethernet port is 192.168.205.1, and the default IP subnet mask is 255.255.255.252.
- The port will accept IP communication only from the IP address 192.168.205.2. Therefore, as long as the factory defaults are in effect, you must assign this address to the Telnet host used to configure IR-IP.

Using the IP learning mechanism, as explained below you can change the default parameters.

---

**Note** *In the default configuration, the IR-IP WAN interface is disabled. In order to enable the WAN interface, you have to modify the Ethernet port address or the IP subnet mask.*

---

---

## C.6 Performing Preliminary Configuration

The software necessary for performing all the management and configuration functions is stored in the IR-IP interface module, and therefore you only need a regular Telnet host to perform all the activities described in this appendix.

A Telnet host is any computer, e.g., an IBM PC or compatible that fulfills the following minimum requirements:

- A standard 10BaseT Ethernet interface
- A TCP/IP protocol stack, and therefore is capable of supporting IP communication through the Ethernet interface
- Telnet client software
- A ping utility.

### Outline of Preliminary Configuration

- To perform the preliminary configuration procedure:
  1. Connect the Telnet host to the IR-IP interface module.
  2. Configure the Telnet host to enable communication with the IR-IP interface module using the default IP parameters.
  3. Establish communication with IR-IP and assign the prescribed IP address to its LAN interface.
  4. Establish again communication with IR-IP and continue the preliminary configuration in accordance with the *Quick Setup Menu* section below.

### Connecting the Telnet Host

Before starting the management and configuration activities, it is necessary to establish IP communication between your Telnet host and the IR-IP interface module. For this purpose, it is necessary to provide a communication path.

Because of the method used to assign an IP address to IR-IP Ethernet port, it is recommended to connect the Telnet host directly to the IP router 10BASE-T connector. This is made by connecting an Ethernet cross cable between the Ethernet connector of the Telnet host and the IR-IP connector.

However, you may also connect through a common LAN: in this case, connect your Telnet host and IR-IP to Ethernet hub ports using straight cables.

### Preliminary Telnet Host Configuration

You can use the IP learning mechanism to configure the IP communication parameters of the IR-IP LAN interface. In this case, skip to the *Assigning the Router LAN Interface Address* section below.

If you prefer to use the factory-default parameters to establish IP communication between your Telnet host and IR-IP, configure the Telnet host as follows:

1. Temporarily configure the host IP address as 192.168.205.2.
2. The initial destination IP address to be used by the host is 192.168.205.1.

---

**Note** *The first step in the preliminary configuration process is to assign the desired IP address to the LAN interface of the IR-IP interface module.*

*After an IP address is assigned and saved, you must change the destination IP address of the Telnet host to the new address, otherwise it is not possible to continue the configuration process. At the same time, you can also change the temporary IP address assigned to the host (192.168.205.2) back to its permanent address.*

---

## Assigning the Router LAN Interface Address

The IP address of the IR-IP LAN interface must be configured as part of the preliminary configuration process. To simplify this process, IR-IP includes a simple and convenient IP address learning mechanism.

The IP address can be configured and changed at any time, even after the complete IR-IP configuration process has been performed, because it does not affect other configuration parameters. Moreover, the IP subnet mask is automatically adapted to the new IP address.

### IP Learning Mechanism

To simplify the configuration process, IR-IP has a special mechanism for configuring the IP address of its LAN interface. Setting section 1, called IP address learning, of the IR-IP DIP switch (*Figure C-3*) to ON enables this mechanism.

The IP learning mechanism enables IR-IP to learn its LAN interface IP address by receiving frames sent by a *ping* utility to the prescribed LAN IP address.

---

**Note** *To use the IP learning mechanism, you do not need to know the current address of IR-IP LAN interface, but only the prescribed IP address.*

---

The IP address is actually retrieved from the ARP frames sent during pinging to locate the *ping* destination, not from the *ping* frames.

To ensure that the process is correctly performed, it is recommended to check the contents of the ARP table before starting the *ping* utility, to make sure that it does not contain the address to be assigned to the IP router LAN interface.

➤ **To view and edit the ARP table contents:**

If the Telnet host you are using runs under Microsoft Inc. Windows™ 95, 98 or NT, use the following procedure to view and edit the ARP table contents:

1. Display the table using the **arp -a** command.
2. If the table includes the intended IP address, remove it from the table using the **arp -d** command.

If for some reason the IP learning process does not succeed, before repeating it make sure to remove the IP address from the table.

## Assigning a LAN IP Address to a New IR-IP

The following procedure enables you to configure the LAN IP address of a new IR-IP router, i.e., a router using the default parameters (see the [Accessing the IR-IP Management Subsystem](#) section above).

If ASMi-31 is already operating, skip Step 2 in the following procedure.

► **To configure the IP router LAN address:**

1. Make sure the preparations described above have been completed, including the configuration of the *ping* utility.
2. Turn ASMi-31 on and monitor the IP router indicators:
  - The INT indicator turns on
  - The ERR indicator lights steadily for approx. 15 seconds, and then starts flashing at a rapid rate (about three times per second).

If the ERR indicator turns off, skip to the [What to Do If ...](#) section below.

3. Set section 1 of IR-IP DIP switch to ON.

The ERR indicator starts flashing faster (approximately four times a second).

4. Send a *ping* to the new address to be used by IR-IP. A confirmation should be received after the third *ping*; after the confirmation, the flashing will slow down to approximately twice a second.

If your host does not begin to receive *ping* replies after three unsuccessful attempts, skip to the [What to Do If ...](#) section below.

5. Return section 1 of the IR-IP DIP switch to the OFF position.

The ERR indicator must turn off.

At this stage, the communication with IR-IP router is lost, because its IP address has been changed. Therefore, you must reconfigure the destination IP address of the Telnet host. If you wish, you may also change the temporary IP address assigned to the host (192.168.205.2) back to its permanent address.

After changing the destination IP address of the Telnet host, it is recommended to turn ASMi-31 off for a few seconds and then back on, before continuing the configuration of the IP router in accordance with the [Quick Setup Menu](#) section below. At this time, in Step 2 the ERR indicator turns off after the 15-second interval.

## Changing the LAN IP Address of a Configured IR-IP

The LAN IP address of an already-configured IR-IP can be changed while it operates, this means it is not necessary to turn ASMi-31 off before starting the configuration procedure. Note however that the IP traffic flow through IR-IP will be disrupted until the other stations in the IP network learn the new address.

To change the LAN IP address of an already-configured IR-IP, use the procedure described above for a new IR-IP with the following differences:

1. Configure the destination address of the *ping* utility to the new LAN interface IP address. It is not necessary to change the Telnet host source address.
2. When ready, set section 1 of the IR-IP DIP switch to ON.  
The ERR indicator starts flashing faster (approximately four times a second).
3. Perform Steps 4, 5 of the procedure used for a new IR-IP.

### What to Do If ...

- **The INT indicator does not light immediately after ASMi-31 is turned on**

The IR-IP interface module does not receive power from the ASMi-31 power supply. Service is required.

---

**Note** *After the power-up process ends, the INT indicator shows LAN integrity. It may stay turned off without indicating power supply failure.*

---

- **The ERR indicator does not light immediately after ASMi-31 is turned on**

IR-IP is faulty and must be replaced.

- **After turn-on, the ERR indicator lights for 15 seconds and then turns off. ACT does not light, and there is no response from IR-IP**

No software loaded into IR-IP. Download software using the procedure described in the [New Software Download Menu](#) section below.

- **After turn-on, the ERR indicator lights for 15 seconds, and then turns off. ACT lights from time to time, but there is no response from IR-IP**

IR-IP has been configured. If you do not know the current IP address of the LAN interface, erase IR-IP router configuration using the procedure given in the [Erasing User's Configuration](#) section below.

- **No ping replies from IR-IP**

- If your host does not begin to receive *ping* replies after three unsuccessful attempts, check the physical connection path between the Telnet host Ethernet interface and the IR-IP 10BASE-T connector.

- **The IP learning process is not successful**

- Check that the prescribed IP address does not appear in the ARP table.
- 

## C.7 IR-IP Management Utility

### General Operating Procedures

The IR-IP interface module is managed via a simple, menu-driven utility that uses a basic terminal user interface. A typical screen is shown in [Figure C-4](#).

As seen in [Figure C-4](#), each screen has a header that identifies the device being configured and its logical name, assigned by the user, followed by the running software revision and date. The bottom line of the screen displays prompts that guide you in the execution of the various activities.

Use the following general procedures to perform the desired activity:

- To change a parameter or to select a menu item, type the corresponding line number.
- For a parameter, which has a discrete set of values, the parameter values are enclosed in brackets [ ]. To select a new value, press the spacebar to scroll among the available values until the desired value is displayed, and then press **<Enter>** to select the displayed value.
- To enter a value which requires free text entry, type in the desired string and then press **<Enter>**. Use backspace to erase the current string.
- After all the parameters have been selected, a prompt appears, requesting that you confirm the changes.

**Note** *For proper display of the screens, you must:*

- *Select a fixed-pitch system font for the display. Use your operating system documentation to find how to select a proper font.*
- *Configure the Telnet utility to use VT-100 terminal emulation.*

## Starting a Management Utility

The management utility is started automatically when Telnet communication is established. If password protection is enabled (see the [Management Access Menu](#) section below), you will be prompted to enter the Telnet password. The opening screen, which appears after the Telnet session activation, is the IR-IP Main menu (see [Figure C-4](#)).

```

IR_IP          <IR-IP>          S/W Ver. 1.00 31/IR
(date)
1. Quick Setup
2. Management Access
3. Advanced Setup
4. Device Control
5. View
6. Diagnostic Tool (PING terminal)
Press one of the numbers to select or ESC:

```

*Figure C-4. IR-IP Main Menu*

To end the utility, press **<Esc>** when the Main menu is displayed. This will also end the Telnet session.

## Menu Structure of Management Utility

[Figure C-5](#) shows the menu structure of the IR-IP management utility.



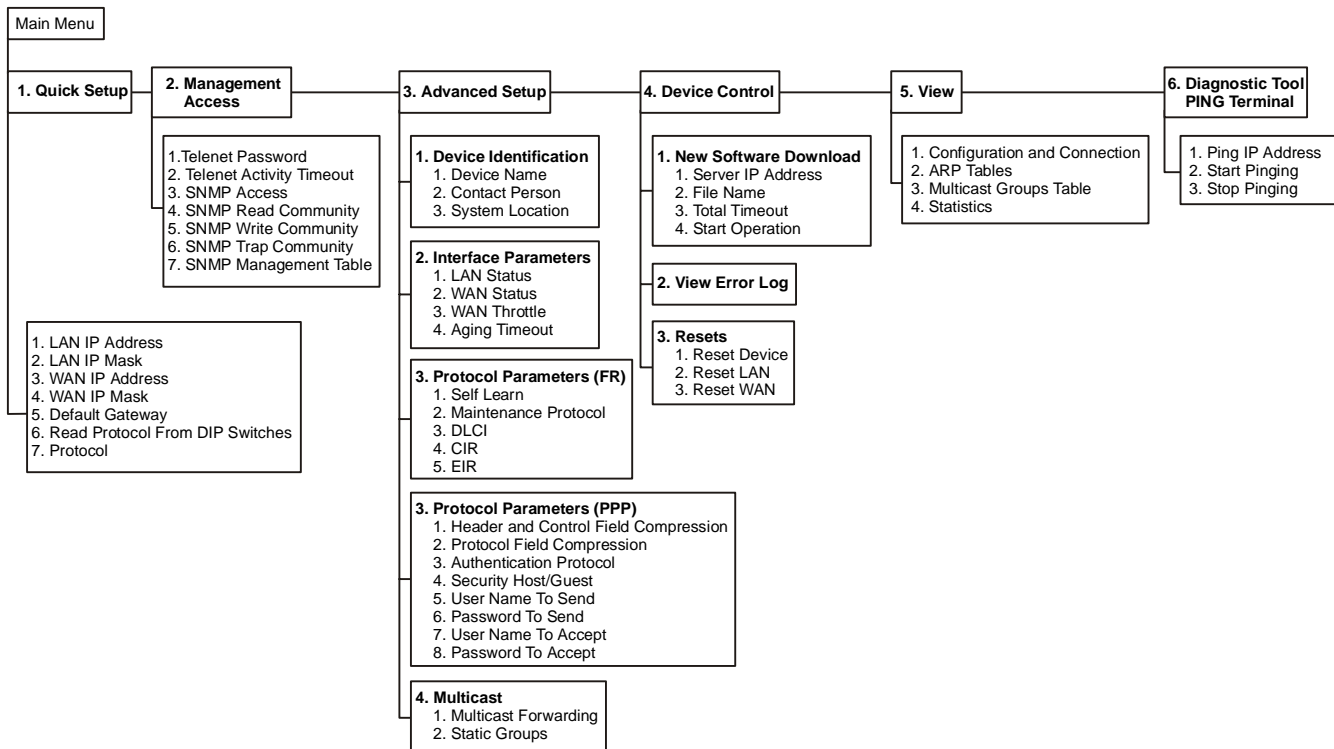


Figure C-5. Management Utility, Menu Structure

## C.8 Quick Setup Menu

The Quick Setup menu is used to select the main parameters' values that must be defined before you start using IR-IP.

Use the Advanced Setup menu (see the [Advanced Setup Menu](#) section below) to specify values for other IR-IP configuration parameters not included in this menu.

► To access the Quick Setup menu:

- From the Main menu, type 1.

The Quick Setup menu appears ([Figure C-6](#)).

IR_IP	<IR-IP>	S/W Ver. 1.00 31/IR
(date)		
Quick Setup		
=====		
1. LAN IP Address	:	192.168.100.001
2. LAN IP Mask	:	255.255.255.000
3. WAN IP Address (empty for unnumbered)	:	.....
4. WAN IP Mask (empty for unnumbered)	:	.....
5. Default Gateway (empty - WAN interface)	:	.....
6. Read Protocol From DIP Switches	:	[ Yes ]
7. Protocol	:	[ Frame Relay ]
Press one of the numbers to select or ESC:		

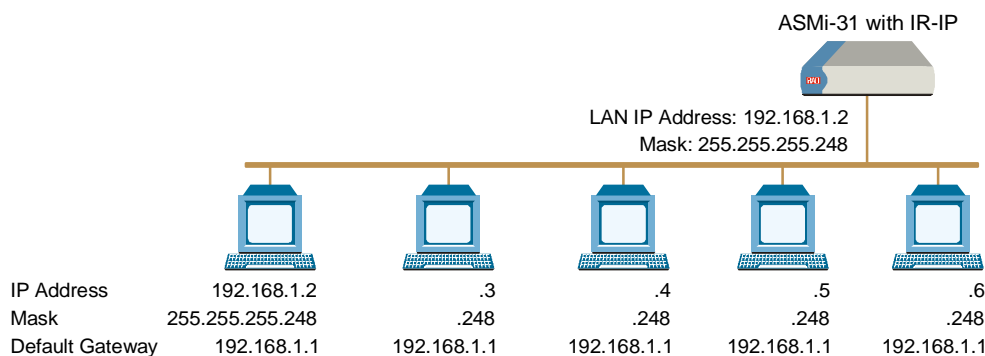
Figure C-6. Quick Setup Menu

## LAN IP Address

Used to enter the IP address for the IP router LAN interface. This is the address to which nodes connected to the local LAN send packets addressed to the WAN.

## LAN IP Mask

Used to enter the IP subnet mask. The IP router supports a maximum of 254 hosts on the LAN, therefore you must use Class C subnet masks. The basic subnet IP mask for Class C addresses, which supports the maximum possible number of hosts, 254, is 255.255.255.0. To help you understand the selection of IP subnet masks, [Figure C-7](#) provides a configuration example for a LAN with 6 nodes: the IP subnet mask for a 6-node IP network is 255.255.255.248.



*Figure C-7. Selecting the IP Subnet Mask*

## WAN IP Address

Used to enter the IP address for the IR-IP WAN interface, i.e., the IP address to be used by IP hosts on the WAN to reach this IR-IP interface module.

If the WAN IP Address field remain blank, IR-IP operates in the Unnumbered Router Mode.

## WAN IP Mask

Used to enter the IP subnet mask for the WAN interface.

## Default Gateway

### Operation without Default Gateway

The IP interface module is intended to enable the extension of LANs through the ASMi-31 link. Therefore, its default routing operation is different from the default routing operation of standard IP routers:

- IR-IP forwards packets with destinations not located on the local LAN through the WAN interface
- Packets received from the WAN interface and destined to hosts located on the local LAN are forwarded to the LAN; other packets are discarded.

The default operation is used when the Default Gateway field is blank.

## Operation with Default Gateway

You can instruct IR-IP to send packets with destinations not located on the local LAN to a specific router, which is called the **default gateway**. The default gateway must be connected to the local LAN.

To use this option, enter the IP address of another router attached to the local LAN in the Default Gateway field.

---

**Note**

*It is very important to obtain the correct parameters from the system administrator or ISP. The most common problem when establishing an IP connection is incorrect configuration of IP parameters and default gateway. Do not try to guess these parameters.*

---

## Read Protocol from DIP Switches

Selecting YES for this parameter forces IR-IP router card to use the WAN protocol selected by section 2 of its DIP switch: PPP or Frame Relay.

If you want to be able to select the WAN protocol by means of the Protocol field (parameter 7) of the Quick Setup menu, select NO.

## Protocol

Used to select the WAN protocol to be used by the IP router card: PPP, HDLC or Frame Relay.

This parameter is available only if the Read Protocol from DIP Switches parameter is set to NO.

---

## C.9 Management Access Menu

The Management Access menu is used to enable the use of passwords to protect the access to IR-IP management utility, and control the inactivity time-out interval.

When password protection is enabled, a Telnet management session can start only after the correct password is entered.

➤ **To access the Management Access menu:**

- From the Main menu, type 2.

The Management Access menu appears ( [Figure C-8](#) ).

IR_IP (date)	<IR-IP>	S/W Ver. 1.00 31/IR
Quick Setup		
Management Access		
=====		
1. Telnet Password	:	.....
2. Telnet Inactivity Timeout (min)	:	300..
3. SNMP Access	:	Disabled
4. SNMP Read Community	:	public....
5. SNMP Write Community	:	public....
6. SNMP Trap Community	:	public....
7. SNMP Management Table	:	>>>
Press one of the numbers to select or ESC:		

Figure C-8. Management Access Menu

**Note** Since the IP router card does not support SNMP management, the SNMP Read Community, SNMP Write Community, SNMP Trap Community, and SNMP Management Table parameters are not used.

## Telnet Password

By default, management access to IR-IP via Telnet is unrestricted. To restrict access, enter a Telnet password by selecting **1** in the Management Access menu. The password can include up to 10 characters, and is case-sensitive. The next time a Telnet session is opened, a password must be entered to enable you to access the IR-IP menus.

At any time, only one Telnet connection to IR-IP is permitted. Any attempt to open an additional connection while the current session is open is rejected.

## Telnet Inactivity Timeout

This parameter specifies the time a Telnet session is kept open when there is no keyboard activity. When the specified time-out expires, the Telnet session is closed and another user can access IR-IP.

---

## C.10 Advanced Setup Menu

The Advanced Setup menu is used to select the desired group of IR-IP configuration parameters.

The parameters accessed through Advanced Setup menu supplement the parameters available on the Quick Setup screen, by providing control over all the other IR-IP parameters.

➤ To access the Advanced Setup menu:

- From the Main menu, press 3.

The Advanced Setup menu appears (*Figure C-9*).

```

IR_IP                               <IR-IP>                               S/W Ver. 1.00 31/IR (date)

Quick Setup
Management Access
Advanced Setup
=====
    1. Device identification
    2. Interface Parameters
    3. Protocol Parameters
    4. Multicast IP

Press one of the numbers to select or ESC:
  
```

*Figure C-9. Advanced Setup Menu*

## Device Identification Menu

The Device Identification menu is used to define and store in the IR-IP logistic information: the logical name of IR-IP, information on the contact person and device location.

➤ To access the Device Identification menu:

- From the Advanced Setup menu, type 1.

The Device Identification menu appears (*Figure C-10*).

```

IR_IP                               <IR-IP>                               S/W Ver. 1.00 31/IR (date)

Quick Setup
Management Access
Advanced Setup
.....
    Device identification
=====
    1. Device Name                      :IR-IP..
    2. Contact Person                   :Name of contact Person
    3. System Location                  :The location of this device

Press one of the numbers to select or ESC:
  
```

*Figure C-10. Device Identification Menu*

### Device Name

Select this parameter to assign an arbitrary name to IR-IP for identification by the system manager (up to eight characters). The assigned name is displayed in the screen header.

## Contact Person

Select this parameter to enter the name of the person to be contacted with matters pertaining to this equipment unit.

## System Location

Select this parameter to enter the physical location of the device.

## Interface Parameters Menu

The Interface Parameters menu is used to control the operation of IR-IP interfaces.

### ► To access the Interface Parameters menu:

- From the Advanced Setup menu, type 2.

The Interface Parameters menu appears (*Figure C-11*).

```

IR_IP                               <IR-IP>                               S/W Ver. 1.00 31/IR (date)

Quick Setup
Management Access
Advanced Setup
.....
    Device identification
    Interface Parameters
=====
    1. LAN Status                      :[ Open  ]
    2. WAN Status                      :[ Open  ]
    3. WAN Throttle                   :[ Full  ]
    4. Aging Timeout (min)             :5.

Press one of the numbers to select or ESC:

```

*Figure C-11. Interface Parameters Menu*

## LAN Status

Used to enable/disable the flow of packets through LAN interface:

- **Open** – the flow of packets is enabled.
- **Closed** – the flow of packets is disabled. As a result, IR-IP does not accept, nor sends packets to the LAN, but its WAN interface may still be active, and can interact with other IP hosts on the WAN.

## WAN Status

Used to enable/disable the flow of packets through the WAN interface:

- **Open** – the flow of packets is enabled.
- **Closed** – the flow of packets through the WAN interface is disabled. As a result, IR-IP does not accept from, nor sends packets to the WAN. However, the LAN interface of the IP router is still active.

## WAN Throttle

This parameter specifies the maximum data rate at which data is sent to the WAN (i.e., to the line). Since ASMi-31 operates with the maximum line rate of 128 kbps, the only relevant parameters for the WAN throttle are 64 kbps and 128 kbps.

## Aging Timeout

Used to specify the time after which inactive LAN stations are removed from the IR-IP ARP table.

A station is defined as inactive when no IP traffic is received from it by the IR-IP LAN interface.

## WAN Protocol Parameters – Frame Relay Protocol Menu

The Frame Relay Protocol Parameters menu is used to configure the parameters Frame Relay WAN for protocol (the WAN protocol is selected by means of the *Quick Setup Menu*) in *Figure C-6*.

- To access the Protocol Parameters menu:
  - From the Advanced Setup menu, type 3.

## Self Learn

Used to specify whether the Frame Relay DLCI and maintenance protocol is learned automatically (ENABLED), or is manually entered (DISABLED).

## Maintenance Protocol

When the Self Learn parameter is DISABLED, use this parameter to specify the desired maintenance protocol.

## DLCI

When the Self Learn parameter is DISABLED, use this parameter to specify the DLCI used for exchanging maintenance protocol messages.

## CIR

Used to specify the maximum amount of data, in bits, which the Frame Relay network guarantees to transfer during the measurement interval (the measurement interval is usually one second).

The value of this parameter is obtained from your Frame Relay service provider.

## EIR

Used to specify the maximum amount of data, in bits, that the Frame Relay network will attempt to deliver during the measurement interval. The value of this parameter is obtained from the Frame Relay service provider.

A typical Frame Relay Protocol Parameters menu is shown in *Figure C-12*.

IR_IP	<IR-IP>	S/W Ver. 1.00 31/IR (date)
Quick Setup		
Management Access		
Advanced Setup		
.....		
Device identification		
Interface Parameters		
Protocol Parameters		
=====		
1. Self Learn	:	[ Enabled ]
2. Maintenance Protocol	:	[ ANSI T1.617 ANNEX D ]
3. DLCI (0-None)	:	0..
4. CIR	:	0.....
5. EIR	:	64000...
Press one of the numbers to select or ESC:		

Figure C-12. Frame Relay Protocol Parameters Menu

## WAN Protocol Parameters – PPP Protocol Menu

The PPP Protocol Parameters menu is used to configure the parameters PPP WAN for protocol (the WAN protocol is selected by means of the (the WAN protocol is selected by means of the *Quick Setup Menu*) in *Figure C-6*.

- To access the Protocol Parameters menu:
  - From the Advanced Setup menu, type 3.

### Header and Control Field Compression

Used to control the use of header and control field compression type according to RFC 1661. It is strongly recommended that this compression be used for troubleshooting only.

### Protocol Field Compression

Used to control the use of protocol field compression type according to RFC 1661. It is strongly recommended that this compression be used for troubleshooting only.

### Authentication Protocol

Used to select the authentication protocol used by an IP router configured as host to validate incoming connections.

### Security Host/Guest

This option can be used to configure the IP router either as a guest unit, to be authenticated by another router, or as a host unit, that authenticates other routers.



## User Name To Send

The name by which an IP router card configured as guest identifies itself.

## Password To Send

The password by which an IP router card configured as guest identifies itself.

## User Name To Accept

The user name to be accepted by an IP router configured as host, when an incoming connection request is received.

## Password To Accept

The user password to be accepted by an IP router configured as host, when an incoming connection request is received.

A typical PPP Protocol Parameters menu is shown in *Figure C-13*.

IR_IP	<IR-IP>	S/W Ver. 1.00 31/IR (date)
Quick Setup		
Management Access		
Advanced Setup		
.....		
Device identification		
Interface Parameters		
Protocol Parameters		
=====		
1. Header and Control Field Compression	:	[ No ]
2. Protocol Field Compression:	:	[ No ]
3. Authentication Protocol	:	[ NONE/NONE ]
4. Security Host / Guest	:	[ Guest ]
5. User Name To Send	:	.....
6. Password To Send	:	.....
7. User Name To Accept	:	.....
8. Password To Accept	:	.....
Press one of the numbers to select or ESC:		

*Figure C-13. PPP Protocol Parameters Menu*

## Multicast IP Menu

The Multicast IP menu is used to specify the IP multicast frame forwarding parameters, and to access the static multicast groups' table.

### ► To access the Multicast IP menu:

- From the Advanced Setup menu, press **4**.

The Multicast IP menu appears ( *Figure C-14* ).

IR_IP	<IR-IP>	S/W Ver. 1.00 31/IR (date)
Quick Setup		
Management Access		
Advanced Setup		
.....		
Device identification		
Interface Parameters		
Protocol Parameters		
Multicast IP		
=====		
1. Multicast forwarding		:[ Disable ]
2. Static groups		:>>>
Press one of the numbers to select or ESC:		

Figure C-14. Multicast IP Menu

## Multicast Forwarding

Used to control the forwarding of IP multicast frames. The following selections are available:

- **DISABLED** – Disables multicast forwarding in both directions.
- **LAN to WAN** – Enables forwarding of IP multicast frames addressed to groups appearing in the Static Multicast Groups table, from the LAN to the WAN.
- **WAN to LAN** – Enables forwarding of IP multicast frames addressed to groups appearing in the Static Multicast Groups table, from the WAN to the LAN.
- **BIDIRECTIONAL** – Enables forwarding of IP multicast frames addressed to groups appearing in the Static Multicast Groups table, in both directions.
- **WAN to LAN + IGMP** – Enables forwarding of IP multicast frames addressed to groups appearing in the Static Multicast Groups table, from the WAN to the LAN. In addition, more groups can be added dynamically (the additional can be viewed using the View menu – [Figure C-19](#)).
- **TRANSPARENT** – All the IP multicast frames are forwarded, irrespective of the Static Multicast Groups table.

## Static Groups

Select this parameter to access the static multicast groups table. The table is used to specify the IP addresses for up to 10 IP multicast groups. You can add, change, or delete each entry in the table (see the prompt line).

### ➤ To access the Static Groups menu:

- From the Multicast IP menu, type **2**.

The following screen appears:

IR_IP	<IR-IP>	S/W Ver. 1.00 31/IR (date)
<b>Static Multicast Groups Table</b> -----		
Group IP Address		
1.	.....	
2.	.....	
3.	.....	
4.	.....	
5.	.....	
6.	.....	
7.	.....	
8.	.....	
9.	.....	
10.	.....	
Press 'A'-add, 'E'-edit, 'D'-delete, 'C'-clear all, 'ESC'-exit:		

Figure C-15. Static Multicast Groups Table

## C.11 Device Control Menu

The Device Control menu is used to download software from TFTP servers and perform interface and device resets.

➤ To access the Device Control menu:

- From the Main menu, type 4.

The Device Control menu appears ([Figure C-16](#)).

IR_IP	<IR-IP>	S/W Ver. 1.00 31/IR (date)
Quick Setup Management Access Advanced Setup Device Control -----		
1. New Software Download 2. View error LOG 3. Resets		
Press one of the numbers to select or ESC:		

Figure C-16. Device Control Menu

## New Software Download Menu

IR-IP operates as a TFTP client, and therefore it is possible to update its software by downloading new software from another computer that operates as a TFTP server.

The New Software Download menu is used to specify the software downloading parameters.

► **To access the New Software Download menu:**

- From the Device Control submenu, type **1**.

New Software Download menu appears (*Figure C-17*).

IR_IP	<IR-IP>	S/W Ver. 1.00 31/IR (date)
Quick Setup		
Management Access		
Advanced Setup		
Device Control		
.....		
New Software Download		
=====		
1. Server IP Address	:	.....
2. File Name	:	.....
3. Total Timeout (sec)	:	..
4. Start operation	:	>>>
Press one of the numbers to select or ESC:		

*Figure C-17. New Software Download Menu*

## Server IP Address

Used to enter the IP address of the TFTP server.

## File Name

Used to enter the name and path of the file to be transferred from the TFTP server.

## Total Timeout

Used to enter the time IP router should wait for an acknowledgment from the TFTP server, for example 60 seconds.

## Start Operation

After selecting all the necessary parameters, type **4** on the New Software Download screen and then press **<Enter>** to start the downloading.

You can follow the progress of the downloading process (indicated by arrows).

Upon completion of the download process, the unit performs a reset. The Telnet connection is lost and must be restarted if required.

## View Error Log Screen

This item of the Device Control submenu is used to view the error log file. This file logs errors detected in IR-IP for debug and technical support purposes.

## Resets Menu

The Resets menu allows you to perform reset of IR-IP, or its interfaces. This operation can be used to restore normal operation after service is disrupted by an abnormal condition. Any data stored in the IR-IP buffers is discarded, and the flow of traffic is temporarily interrupted.

➤ **To access the Resets menu:**

- From the Device Control menu, type **3**.

The following screen appears:

```

IR_IP                               <IR-IP>                               S/W Ver. 1.00 31/IR (date)

Quick Setup
Management Access
Advanced Setup
Device Control
.....
    New Software Download
    View error LOG
    Resets
=====
    1. Reset Device
    2. Reset LAN
    3. Reset WAN
Press one of the numbers to select or ESC:

```

Figure C-18. Resets Menu

### Reset Device

➤ **To restart IR-IP:**

- From the Resets menu, type **1**.

You will be prompted to confirm the reset operation.

---

**Note**     *Resetting the device will restart the IR-IP interface module, and therefore traffic flow is temporarily interrupted, and the Telnet connection is lost.*

---

### Reset LAN

➤ **To reset the LAN interface:**

- From the Resets menu, type **2**.

You will be prompted to confirm the reset operation.

---

**Note**

*This operation restarts the IR-IP LAN controller.*

*To continue your Telnet session, press any key within 15 seconds following the confirmation of the reset operation.*

## Reset WAN

### ► To reset the WAN interface:

- From the Resets menu, type **3**.

You will be prompted to confirm the reset operation.

**Note** *Resetting the WAN interface causes the WAN controller to be restarted. This results in renegotiation of the WAN protocol parameters.*

*To continue your Telnet session, press any key within 15 seconds following the confirmation of the reset operation.*

## C.12 View Menu

The View menu is used to view the IR-IP configuration data, and display information on its ARP tables, multicast Groups tables and statistics.

### ► To access the View menu:

- From the Main menu, type **5**.

The View menu appears (*Figure C-19*).

```

IR_IP                               <IR-IP>                               S/W Ver. 1.00 31/IR (date)

Quick Setup
Management Access
Advanced Setup
Device Control
View
-----
  1. Configuration and Connection
  2. ARP Tables
  3. Multicast Groups Table
  4. Statistics

Press one of the numbers to select or ESC:

```

*Figure C-19. View Menu*

## Configuration and Connection

This screen is used to view the configuration parameters of IR-IP. In addition, you can also view the current status of the LAN and WAN interface.

➤ To access the Configuration and Connection screen:

- From the View menu, type 1.

The View Configuration screen appears (*Figure C-20*).

IR_IP		<IR-IP>		S/W Ver. 1.00 31/IR	
(date)					
VIEW CONFIGURATION					
-----					
BOOT Version		:1.06 18.03.1999			
Device Name		:IP router card			
System Location		:The location of this device			
Contact Person		:Name of contact Person			
MAC Address		: 00-20-D2-16-3F-9B			
Default Gateway		: WAN			
Intrf Type		Baud(Kbps)	Prot	IP Address	IP
Mask		Status			
.....					
LAN	UTP	-----	Ethr	192.168.205.005	
		255.255.255.000	Connected		
WAN	V.110	FR	Not Conn.		
Press any key to continue:					

Figure C-20. View Configuration Screen

## ARP Tables

This screen is used to display the IR-IP ARP table. This table shows the IP address assigned to each station on the LAN (the stations are identified by their MAC addresses).

➤ To access the ARP Tables screen:

- From the View menu, type 2.

The ARP Tables screen appears (*Figure C-21*).

IR_IP		<IR-IP>		S/W Ver. 1.00 31/IR (date)	
ARP Table					
-----					
IP Address		MAC Address		IP Address	
192.168.205.003		00-40-33-20-C8-3C			
Press any key for exit					

Figure C-21. ARP Tables Screen

## Multicast Groups Table Screen

This screen is used to display information about the multicast group IP addresses and their status.

➤ **To access the Multicast Groups Table screen:**

- In the View menu, type 3.

The Multicast Groups Table screen appears (*Figure C-22*).

IR_IP	<IR-IP>	S/W Ver. 1.00 31/IR (date)
Multicast Groups Table		
-----		
Group IP Address Status	Group IP Address Status	
Press any key for exit		

*Figure C-22. Multicast Groups Table Screen*

## Statistics Screen

The Statistics screen is used to display statistical information on the traffic between the networks connected by IR-IP. The data displayed on this screen enables you to evaluate the IR-IP performance. Two different Statistics screens are used, one for the LAN side and the other for the WAN side.

➤ **To access the Statistics menu:**

- In the View menu, type 4.

The LAN and WAN Statistics screens appear (*Figure C-23* and *Figure C-24*).



IR_IP	<IR-IP>	S/W Ver. 1.00 31/IR (date)	
SYSTEM STATISTICS			
-----			
Counter Name	Val	Counter Name	Val
LAN in Octets	83504	LAN IP Header Errors	0
LAN Unicast Frames In	1	LAN IP Address Errors	0
LAN Non-Unicast Frames In	9	LAN Alignment Errors	0
LAN Out Octets	83504	LAN CRC Errors	0
LAN Unicast Frames Out	3560	LAN Single Collisions	0
LAN Non-Unicast Frames Out	0	LAN Multiple Collisions	0
LAN to WAN Frames Passed	1698	LAN Late Collisions	0
LAN IP Datagram Received	2638	LAN Excessive Collisions	0
LAN to CPU Frames Discarded	0	LAN Frames Too Long Errors	0
LAN to WAN Frames Discarded	0	LAN RX FIFO Overrun Error	0
LAN Out Errors	0	LAN SQE Transmitted	0
LAN RX Frames Errors	0	LAN Deferred Frames	1
LAN MAC Receive Errors	0	LAN Carrier Sense Lost	0
LAN MAC TX Errors	0	LAN FIFO Underrun	0
N - Next Screen. ESC - Back To Previous Menu.			
R - Refresh Page. C - Clear The Counters Of This Page.			

Figure C-23. LAN Statistics Screen

IR_IP		<IR-IP>		S/W Ver. 1.00 31/IR (date)	
SYSTEM STATISTICS					
-----					
Counter Name		Val	Counter Name		Val
WAN in Octets		83504	WAN Alignment Errors		0
WAN Out Octets		1950	WAN Aborted Frames		0
WAN Out Frames		1723	WAN Short Frames		0
WAN to LAN Frames Transfer		1698	WAN RX FIFO Overrun Error		0
WAN IP Datagram Received		1723	WAN to CPU Frames Errors		0
WAN to CPU Discarded		0	WAN Frame Too Long Errors		0
WAN to LAN Discarded		0	WAN IP Header Errors		0
WAN Out Errors		0	WAN IP Addres Errors		0
WAN CRC Errors		0			
PPP Address Error		0			
PPP Control Error		0			
DLCI Unrecognized Error		0			
Frame Relay Forward Conge		0			
Frame Relay Backward Conge		0			
P - Previous Screen. ESC - Back To Previous Menu.					
R - Refresh Page. C - Clear The Counters Of This Page.					

Figure C-24. WAN Statistics Screen

## C.13 Diagnostic Tool (Ping Terminal) Menu

This section provides information on the diagnostic tool provided with IR-IP (the *ping* utility).

➤ To access the Diagnostic Tools menu:

- In the Main menu, type 6.

The Diagnostic Tools menu appears ( *Figure C-25*).

```

IR_IP                                <IR-IP>                                S/W Ver. 1.00 31/IR (date)

Quick Setup
Management Access
Advanced Setup
Device Control
View
Diagnostic Tools (PING terminal)
=====
  1. Ping IP Address                                :192.168.100.011
  2. Start Pinging                                :>>>
  3. Stop Pinging                                :>>>

Press one of the numbers to select or ESC:

```

Figure C-25. Diagnostic Tools Menu

## Using the Ping Function

The Ping option is used to confirm IP connectivity by *pinging* other IP hosts. Connectivity is confirmed by receiving a reply from the remote (pinged) IP host.

### ► To ping a host:

1. From the Diagnostic Tools menu, type **1** and enter the desired host IP address.
2. Press **<Enter>** to confirm the destination IP address.
3. To start pinging, type **2** on the Diagnostic Tools screen.

After pinging starts, you can monitor the *ping* status. A typical screen is shown in [Figure C-26](#).

---

**Note** *After pinging is started, it continues in the background even if you exit the Diagnostics Tools screen. In this case, a Ping Running message appears in the top upper left-hand corner of the screen.*

---

4. To stop pinging, type **3** from the Diagnostic Tools menu.

A **Ping Stopped** message is displayed.

To clear the message and return to the Diagnostic Tools screen, press any key.

```
IR_IP                                <IR-IP>                                S/W Ver. 1.00 31/IR (date)

Quick Setup
Management Access
Advanced Setup
Device Control
View
Diagnostic Tools (PING terminal)
=====
  1. Ping IP Address                      :192.168.100.011
  2. Start Pinging                        :>>>
  3. Stop Pinging                        :>>>

Pinging 192.168.212.001 Sent 27 Recvd 25  Lost 2  Resp.Time 60 ms

Press one of the numbers to select or ESC:
```

*Figure C-26. Diagnostic Tools Menu after Receiving Pinging Response*

---

## C.14 Erasing User's Configuration

The user-defined configuration parameters are stored in the IP router card flash memory. After the user-defined configuration parameters are erased, the IP router card automatically loads the default parameters.

You may want to erase the current configuration parameters:

1. Before IR-IP is prepared for operation in a new application.
2. When you cannot configure IR-IP because its current LAN-interface IP address and/or the Telnet password, are not known.

➤ **To erase the user's configuration:**

1. Turn ASMi-31 off.
2. Set all the four sections of the IR-IP DIP switch to ON.
3. Turn ASMi-31 on and monitor the ERR indicator: it must turn on and start blinking.
4. While the ERR indicator is blinking (within 15 seconds), set sections 1 and 2 of the DIP switch to OFF.

When the ERR indicator stops blinking and lights steadily, the IP router configuration becomes erased.

**Note**

*If you do not set sections 1 and 2 to OFF within 15 seconds of power-up, the IP router card ignores the setting of all the four sections to ON and starts normal operation. In this case, it is recommended to turn ASMi-31 off and then back on. To abort the whole operation, turn ASMi-31 off, return all the four-switch section to the desired positions, and then turn ASMi-31 on again.*

5. Turn ASMi-31 off, and the return all the four sections of the DIP switch to the desired positions.

---

## C.15 Erasing IR-IP Software

You may erase the IR-IP application software, without erasing the user-defined parameters.

After the application software is erased, IR-IP starts its TFTP server application, and waits for the downloading of software by a TFTP client connected to its LAN interface. The procedure to be used to download the application software in this case is also described below.

You may want to erase the application software if the downloading of new software using the Device Control menu (see [Figure C-16](#)) fails, and IR-IP does not function properly.

## Erasing Application Software

► To erase the application software:

1. Turn ASMi-31 off.
2. Set all the four sections of IR-IP DIP switch to ON.
3. Turn ASMi-31 on and monitor the IP router ERR indicator: it must turn on and start blinking.
4. While the ERR indicator is blinking (within 15 seconds), set sections 3 and 4 of the DIP switch to OFF.

When the ERR indicator stops blinking and lights steadily, the IP router configuration becomes erased.

**Note**

*If you do not set sections 3 and 4 to OFF within 15 seconds of power-up, IR-IP ignores the setting of all the four sections to ON and starts normal operation. In this case, it is recommended to turn ASMi-31 off and then back on.*

*Alternately, to abort the whole operation, turn ASMi-31 off, return all the four switches to the desired positions, and then turn ASMi-31 on again.*

5. Turn ASMi-31 off, and then return all the four sections of the DIP switch to the desired positions.

## Downloading New Software

After erasing the application software, you can download new software from any computer that can serve as a TFTP client.

To enable the downloading, IR-IP automatically activates its TFTP server application with the following factory-default IP parameters:

- IP address: 192.168.205.1
- Subnet mask: 255.255.255.252.

Connect the computer serving as a TFTP client to the IR-IP 10BASE-T connector in the way as a Telnet host used for preliminary configuration (see the [Performing Preliminary Configuration](#) section). The computer IP parameters must be configured as follows:

- IP address 192.168.205.2
- Subnet mask 255.255.255.252
- Default gateway 192.168.205.1

► To download new software:

1. If necessary, turn ASMi-31 off.
2. Set all the four sections of the IR-IP DIP switch to OFF.
3. Turn ASMi-31 on and monitor the ERR indicator: it must start flashing.
4. Connect the computer to the IP router LAN interface and configure its IP parameters as explained above.

5. Run a standard TFTP client application on the Telnet host, and download the appropriate software file.

If the download is successful, IR-IP starts using the new software.

If the downloading fails, repeat the download process.





# Appendix D

## IR-G.703/CO Interface Module

### D.1 Introduction

IR-G.703/CO is an interface module for RAD modems, converting G.703 64 kbps codirectional signals to TTL levels. The converted data is sent over the modem link using the modem modulation technique and converted back at the other end into G.703 64 kbps codirectional signals, or into any other digital interface signal possible. The module is available in the following two versions:

- Standalone version, which fits into a standalone modem and is available with two types of physical connections: a terminal block or an RJ-45 (see [Table D-1](#) for the RJ-45 connector pinout).
- Rack version, which is mounted on the ASMi-31/R modem card and uses the modem edge connector for communication. The edge connector is wired, on the motherboard of the card cage, to the DB-25 connector on the back plane of the ASM-MN-214 card cage (see [Appendix A](#) for the DB-25 connector pinout).

[Figure D-1](#) illustrates the rear panel of the ASMi-31 modem equipped with the IR-G.703/CO interface module.

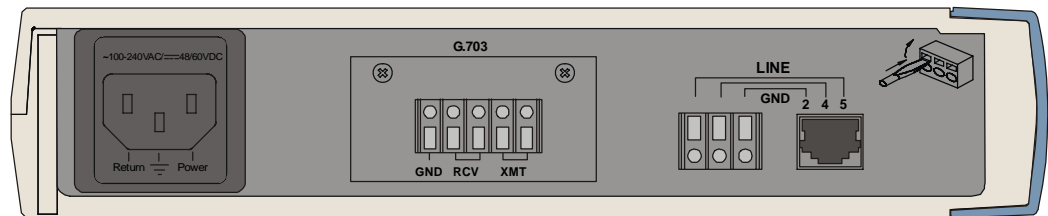


Figure D-1. Rear Panel of ASMi-31 with IR-G.703/CO Module

Table D-1. RJ-45 Connector Pinouts

Pin	Function
3	RCV (+)
6	RCV (-)
4	XMT (+)
5	XMT (-)
2	GND

**Note** For the G.703 codirectional interface, byte synchronization is not kept end-to-end. A violation bit is inserted every eight bits, but it does not appear in the same location at the remote end.

## D.2 Selecting the IR-G.703/CO Timing

The IR-G.703/CO interface module can operate with EXT or INT/RCV timing to match the clock reference of the ASMi-31 modem. The clock selection is made via the JP1 jumper located on the module board (see [Figure D-2](#)).

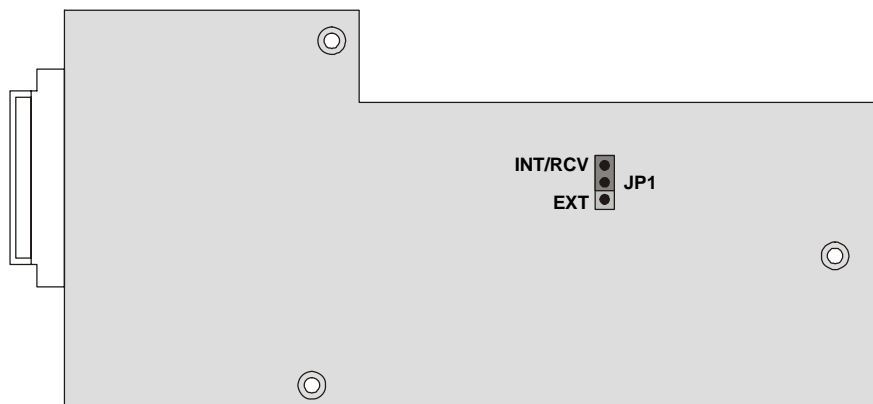


Figure D-2. JP1 Location on the IR-G.703/CO Board

### EXT Timing

The EXT clock is used in applications, where the system timing is provided by the G.703 network. The IR-G.703/CO module has an internal buffer to compensate for the phase delay introduced to the system by the line delay between the two modems. The buffer is an 8-bit FIFO connected as shown in [Figure D-3](#).

You must configure the IR-G.703/CO module to the EXT clock if the ASMi-31 modem is also set to the external timing.

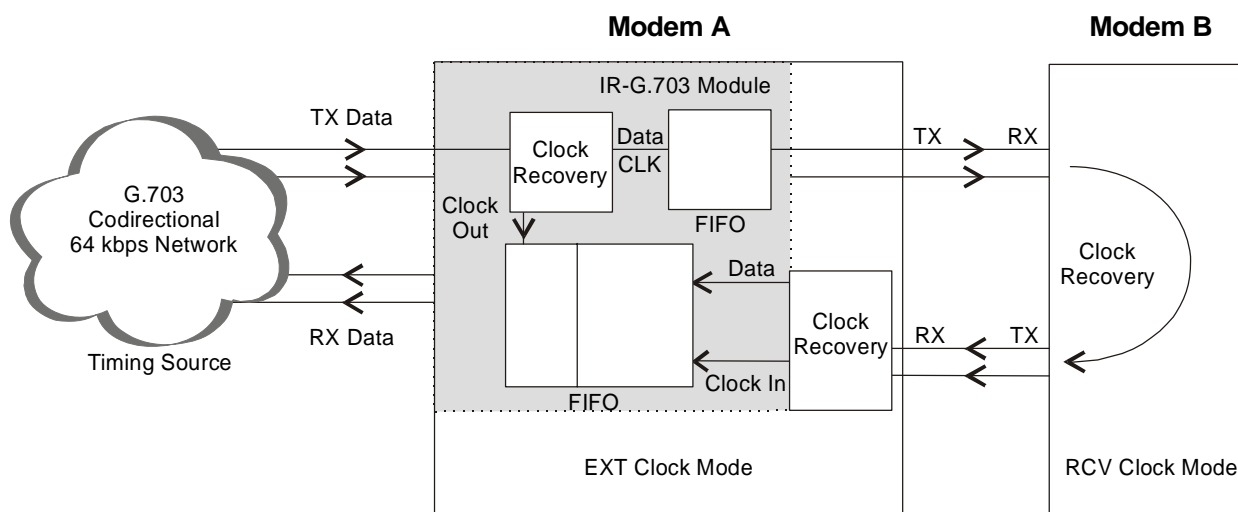


Figure D-3. IR-G.703/CO EXT Timing

## INT/RCV Timing

The INT/RCV clock is used in applications where the G.703 codirectional 64 kbps equipment connected to the modem recovers the clock signal from the modem link. This mode is used mainly when the attached equipment has a G.703 codirectional interface, but is not able to produce clock signals. The module has an 8-bit FIFO buffer to compensate for the phase delay introduced by the G.703 device. [Figure D-4](#) illustrates the buffer connection and the required application setup.

You must configure the IR-G.703/CO module to the INT/RCV clock if the ASMi-31 modem is set to the internal or receive timing.

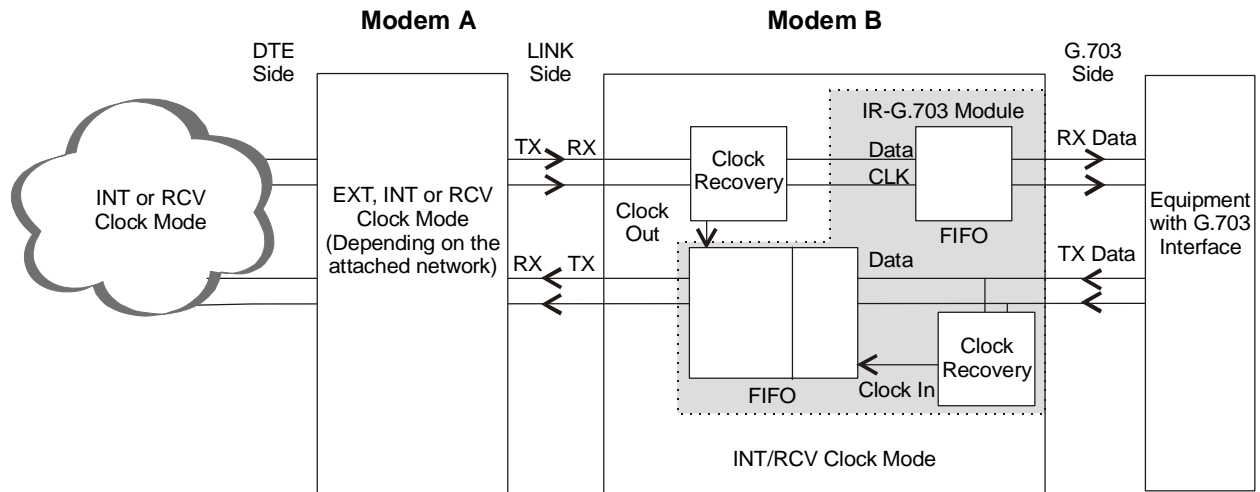


Figure D-4. IR-G.703/CO INT/RCV Timing





**data communications**

Innovative Access Solutions

24 Raoul Wallenberg Street, Tel Aviv 69719, Israel

Tel: +972-3-6458181, Fax +972-3-6483331, +972-3-6498250

E-mail: [erika\\_y@rad.com](mailto:erika_y@rad.com), Web site: <http://www.rad.com>

# Customer Response Form

RAD Data Communications would like your help in improving its product documentation. Please complete and return this form by mail or by fax or send us an e-mail with your comments.

Thank you for your assistance!

**Manual Name:** ASMi-31 version 3.0

**Publication Number:** 646-202-02/07

Please grade the manual according to the following factors:

	<i>Excellent</i>	<i>Good</i>	<i>Fair</i>	<i>Poor</i>	<i>Very Poor</i>
Installation instructions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Operating instructions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manual organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Illustrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The manual as a whole	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What did you like about the manual?

---

---

---

---



## Error Report

Type of error(s) or problem(s):

- ☐ Incompatibility with product
- ☐ Difficulty in understanding text
- ☐ Regulatory information (Safety, Compliance, Warnings, etc.)
- ☐ Difficulty in finding needed information
- ☐ Missing information
- ☐ Illogical flow of information
- ☐ Style (spelling, grammar, references, etc.)
- ☐ Appearance
- ☐ Other \_\_\_\_\_

Please list the exact page numbers with the error(s), detail the errors you found (information missing, unclear or inadequately explained, etc.) and attach the page to your fax, if necessary.

---

---

---

---

Please add any comments or suggestions you may have.

---

---

---

You are:

- ☐ Distributor
- ☐ End user
- ☐ VAR
- ☐ Other

Who is your distributor?

Your name and company:

Job title:

Address:

Direct telephone number and extension:

Fax number:

E-mail:

---

---

---

---

---

---


---

---









Publication No. 646-202-02/07

## **International Headquarters**

24 Raoul Wallenberg Street  
Tel Aviv 69719, Israel  
Tel. 972-3-6458181  
Fax 972-3-6498250, 6474436  
E-mail [market@rad.com](mailto:market@rad.com)

## **North America Headquarters**

900 Corporate Drive  
Mahwah, NJ 07430, USA  
Tel. 201-5291100  
Toll free 1-800-4447234  
Fax 201-5295777  
E-mail [market@radusa.com](mailto:market@radusa.com)

**[www.rad.com](http://www.rad.com)**



**data communications**

Innovative Access Solutions